

SALEM SOUND
MARINE SANITATION
NEEDS ASSESSMENT

FINAL REPORT
and
GUIDANCE DOCUMENT

December 2005

Prepared by the
Salem Sound Coastwatch

For the
Massachusetts Office of Coastal Zone Management

This report was prepared for the:

Massachusetts Office of Coastal Zone Management

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1. EXECUTIVE SUMMARY

Salem Sound Coastwatch's Marine Sanitation Needs Assessment has successfully surveyed the boating community in Salem and Beverly Harbors and the Danvers River. An amazing survey return rate of 21% plus the cooperation of harbormasters, pumpout operators, marinas, and yacht clubs have resulted in the compilation of a tremendous amount of information regarding sewage disposal behavior and attitudes, obstacles to proper disposal of boat-based sewage, and the frequency of vessel sewage discharge within 3-miles of shore. Vessel sewage dumping is generally hard to detect or quantify, but the anonymity of the survey encouraged boaters to be truthful about their practices and concerns. From the high return rate of the anonymous surveys, it is obvious that Salem Sound has an active boating community that wants to be involved and responsive to the issues facing them.

By federal law, the discharge of untreated sewage is illegal within three nautical miles of the shore. The study shows that illegal sewage disposal is taking place in Salem Sound at marinas, yacht clubs, on moorings, and within three miles of shore. However, the majority of boaters do not dump overboard. On the whole, boaters are aware of the law and the environmental and health risks of discharging sewage directly into the water. Most support a No Discharge designation for Salem Sound. However, to reach the goal of cleaner waters in Salem Sound, it is important to reach all boaters and to educate and change behaviors of those who do not currently comply with this law. This is where the details of the survey will become extremely useful in developing educational campaigns and services.

The key findings from the boaters' survey are as follows:

- ☐ Ninety-six percent are aware of the federal law that prohibits discharging untreated sewage from vessels within all navigable waters of the U.S. including coastal waters (within 3-miles of shore).
- ☐ Eighty-one percent report that their boats are equipped with a MSD or a portapottie. Of these, 39% report having Type III MSDs, i.e. holding tanks, and 24% have portapotties onboard. Only two percent report having Type II MSDs, while 12% have Type I MSDs. Four percent do not know what MSD type they have, and one percent skipped the question.
- ☐ If these percentages are representative of the larger Salem Sound boat population, then the designation of a Salem Sound No Discharge Area (NDA) would affect approximately 20% of the boats. Since holding tanks are required in a NDA, the 63% of boats that have Type III MSDs or portapotties would not be affected. Nor would it affect the 18% of boats that currently have no facilities because recreational boats are not required to be equipped with an installed toilet. NDA does not prohibit the discharge of gray water.

- ❑ Eighty-six percent are supportive of Salem Sound becoming a No Discharge Area.
- ❑ Less than half of the respondents have used pumpout facilities. That is, 58% say they have not used local pumpout facilities. The 58% included boats with MSDs Type I, II, and III.
- ❑ While awareness of local pumpout facilities by MSD owners is high, ranging from 89% to 94%, 11% of MSD Type III owners do not know of any pumpout services in their local area.
- ❑ Twenty-five percent spend 50% or more of their boating time on the mooring or at the slip.
- ❑ Twenty-eight percent of the total survey respondents have experienced problems with pumpout services during the past two years. Lack of availability and inconvenience are the most frequent problems cited.
- ❑ Seventy percent say they never dump overboard.
- ❑ Dumping within 3-miles of the coast and/or at the mooring or slip is taking place by at least 15% of the survey population. Boats with Type I and II MSDs can legally discharge sewage into Salem Sound since it is not a NDA, but dumping is not just restricted to boats with Type Is and IIs. Fifty-five percent of those who dump within the Sound have holding tanks, portapotties or no facilities onboard.
- ❑ Thirty-five percent of those who dump within 3-miles say they dump because pumpout services are unavailable.
- ❑ There is confusion in the general boating community as to what a NDA would mean, what constitutes treated or untreated sewage, and how MSDs operate.

It is clear from this assessment that there is room for improvement in Salem Sound pumpout facilities and operating schedules, and boater awareness of these services. There are many recommendations as to how to accomplish this by involving recreational and commercial boaters, harbor masters, marinas, boatyards, and yacht clubs. The marine sanitation message should be proactive, staying energized towards the goal of cleaner waters for boating. Salem Sound Coastwatch recommends, as a first step, the formation of a Salem Sound Working Group to discuss and prioritize recommendations, and then begin implementation of selected recommendations. Increased boater education regarding the pumpout services in Salem Sound and improved signage about available services are top priorities. If pumpout facilities are convenient, free or inexpensive, and easy to access without a long wait, boaters will dispose of their sewage in the proper manner. The following report provides information and recommendations that can lead to actions. With follow-through, these actions have the possibility of changing behaviors, improving services, and ultimately, achieving the goals of reduced illegal sewage dumping and cleaner water in Salem Sound.

2. INTRODUCTION

2.1 STUDY DESIGN

During the summer and fall of 2005, Salem Sound Coastwatch (SSCW) conducted a marine sanitation needs assessment. A boaters' survey with thirty-one questions was developed. The survey asks general questions about one's boat and its use, then specific questions about onboard marine sanitation devices and the use of pumpout facilities. Finally, questions address federal regulations and the affects of sewage discharge. Nowhere does the survey ask for one's name or address. The intent was to have an anonymous survey such that boaters would feel free to be truthful.

Surveys were mailed to 4,063 mooring permit holders in the Danvers River, Beverly Harbor and Salem Harbor (Marblehead and Salem). Since the survey was not mailed to boaters moored in Manchester and Marblehead Harbors, Marblehead and Manchester harbors and transient boaters were not targeted recipients of the survey. At the time the study was designed, it was decided to limit the area to provide more thorough coverage. The survey was also available online at the SSCW website's homepage and publicized in local newspapers, SSCW newsletter and events, and at marinas and yacht clubs. The survey questionnaires are in Appendix 7.

The harbormasters from Danvers, Beverly, Salem and Marblehead were interviewed as well as a pumpout operator from each community. Marina operators were also interviewed, although not all were reached during the time period of the study. A public forum, Cleaner Waters for Boating, was held on December 13, 2005 at the Danversport Yacht Club to discuss the results of the survey and to continue the dialogue about how to improve marine sanitation facilities and practices in Salem Sound.

The overall goals of the Salem Sound Marine Sanitation Needs Assessment were to:

- Acquire a better understanding of the boating community's behavior and attitudes as it pertains to sewage disposal;
- Assess perceived and real obstacles to proper disposal of boat-based sewage;
- Understand the frequency of vessel sewage discharge within the evaluation area; and
- Identify local solutions for improving boaters' practices and reducing illegal sewage discharge from recreational and commercial vessels.

The goals of the boaters' survey were to:

- Collect data on how boaters dispose of their sewage waste;
- Determine if boaters are familiar with local pumpout facilities and if they use them;
- Determine the common problems experienced by boaters when using pumpouts;
- Evaluate if boaters have an understanding of the connection between raw sewage and water quality;
- Assess perceived and real obstacles to proper disposal of boat-based sewage;
- Identify local solutions for improving pumpout practices.

The harbormaster, pumpout operator and marina operator interviews were aimed at:

- Collecting data on how frequently pumpouts are used;
- Determining how well pumpout facilities work and the problems operators experience; and
- Determining ways of enhancing the community pumpout programs.

From the results of the surveys, interviews, and public forum, Salem Sound Coastwatch has developed this report as a guidance document containing recommendations for boaters, public health officials, harbormasters, marinas and yacht clubs. The goal of this study is to provide concrete actions for changing behaviors and instituting improved practices and regulations to reduce illegal sewage dumping.



Salem Sound Marine Sanitation Needs Assessment

Marinas, Yacht Clubs and Harbormasters

Study Area: Danvers River, Beverly Harbor, Salem Harbor

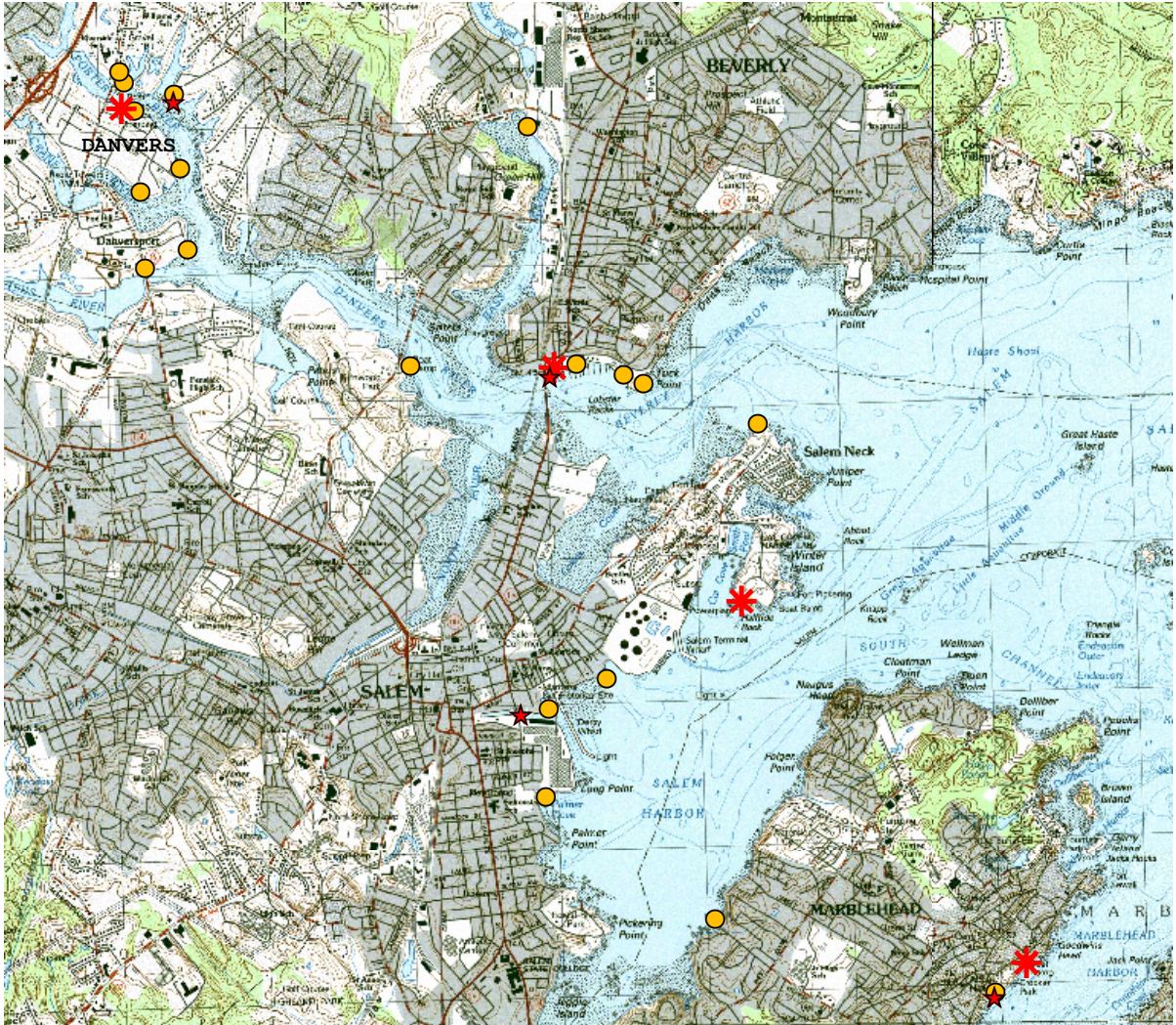


Figure 1. USGS map of Salem Sound study area with boating facilities

2.2 BACKGROUND

2.2.1 SALEM SOUND ASSESSMENT

Salem Sound on the North Shore of Massachusetts has a long history of shipping, fishing and general boating activities because of its harbors and rivers. Over seven thousand recreational boaters moor in the Sound every year. There are eleven marinas, four yacht clubs and seven public landings within the study area. Marblehead, Salem and Beverly harbormasters each have one Clean Vessel Act (CVA) funded pumpout boat. CVA dockside pumpouts are available at Crocker's Marina, Marblehead, and Congress St. dock, Salem. Beverly harbormaster is installing a dockside pumpout at the public dock that should be useable in 2006. Danvers does not have any CVA funded pumpout facilities. Boaters are serviced by the Danversport Yacht Club at their fuel dock and lift ramp.

In the 1960's, a study of Salem Sound found gross contamination from land based sewage being directly discharged into the rivers and harbors. Then, boaters had to put up with the polluted waters, but times have changed. Since the Clean Water Act, the waters of Salem Sound have become cleaner because of improved sanitation practices by boaters, the availability of five CVA funded pumpout facilities, and land-based wastewater treatment plants.

By federal law, the discharge of untreated sewage is illegal within three nautical miles of the shore. However, boat-based discharges are difficult to spot, especially if the vessel is underway or the release is at night, and enforcement can be difficult. Therefore, it is nearly impossible to know how common such events are. If they are occurring, large volumes of bacteria-laden and nutrient-rich effluent could be entering the marine environment.

Since ocean sewage dumping is generally hard to detect or quantify, the extent of illegal sewage disposal is hard to know. But, when there are beach closures or concerns about water quality, often boaters get blamed. Through the Salem Sound Marine Sanitation Needs Assessment, the boating community has had an opportunity to share their sanitation practices and comments on what is needed to make it easier for boaters to do the right thing for the marine environment. Most importantly, this Marine Sanitation Needs Assessment will provide guidance as to next steps for cleaner waters for boating and recreation in Salem Sound.

2.2.2 FEDERAL REGULATIONS

The Clean Water Act prohibits the discharge of untreated sewage from a boat into waters within three nautical miles of shore and sets into motion Environmental Protection Agency (EPA) regulations on federal performance standards for marine sanitation devices (MSDs). The term MSD refers to any equipment installed onboard a vessel, which is designed to receive, retain, treat, or discharge sewage and any process, which treats this sewage. Since January 30, 1980, if a vessel has an installed toilet, it must be equipped with one of three types of US Coast Guard certified MSDs. By federal law, boats longer than 65 feet in length must have a Type II or III MSD, while boats less than 65 feet can use Type I, II, or III. Since portable toilets can be moved on and off a vessel, they are not considered installed toilets.¹

Type I and II marine sanitation equipment treat the waste and then discharge it into the water. **It is legal to discharge from either Type I or Type II within three nautical miles of shore, except within a designated No Discharge Area (NDA).** A Type III MSD is basically a holding tank, which retains the waste onboard until it can be pumped out and properly disposed of at a sewage treatment plant or discharged outside of state waters. Type III MSDs can also be recirculators or incinerators, but the end result is that no sewage is discharged into the water. **Discharging of Type III holding tank contents within three nautical miles of the shoreline is illegal.**

EPA's provides the following table, which clearly defines the differences in the MSD types, although boats less than 65 feet in length may have Type II MSDs.

Types of Marine Sanitation Devices		
Sewage Treatment Device	Vessel Length	Standard
Type I- Flow-through device (maceration and disinfection)	equal to or less than 65 feet in length	The effluent produced must not have fecal coliform bacteria counts greater than 1000 per 100 milliliters and have no visible floating solids.
Type II- Flow-through device (maceration and disinfection)	greater than 65 feet in length	The effluent produced must not have fecal coliform bacteria counts greater than 200 per 100 milliliters and suspended solids not greater than 150 milligrams per liter .
Type III- Holding tank	any length	This MSD is designed to store sewage, a holding tank, until it can be pumped out at a boat or shore-side facility or discharged beyond 3 miles of shore.

¹ EPA. Using your head to help protect our aquatic resources. Vessel Sewage Discharge Program. Last updated on Tuesday, February 17th, 2004. URL: http://www.epa.gov/owow/oceans/regulatory/vessel_sewage/vsdflyer.html

Although Type I and Type II MSDs provide some form of sewage treatment to lower fecal coliform counts and reduce suspended solids, the Massachusetts state water quality standards are still much higher than what generally is accepted. For example, approved shellfish harvesting areas must have a water quality equal or less than 14 fecal coliform colonies per 100mL. The water at swimming beaches is tested every week during the summer. Beaches are closed to swimming if a single water test has Enterococci levels greater than 104 CFU/100 mL or if the geometric mean of the most recent five tests for Enterococci exceeds 35 colonies per 100mL. Before Enterococci became the standard indicator for bacterial contamination, beaches were closed if fecal coliform levels were greater than 200 colonies per 100 mL. Therefore, flushing a Type I or II near a swimming area could possibly close the beach. Holding tanks and portapotties contain deodorizers and other chemicals but do not treat or disinfect the sewage in any way.

A state may prohibit the discharge of any sewage, treated or untreated, from all vessels in designated NDAs. A written application to the EPA Administrator must be made by the state on behalf of the area that is seeking No Discharge designation. The Administrator's affirmative determination is dependent on the availability of adequate pumpout facilities for the safe and sanitary removal and treatment of sewage from all vessels. In a NDA, flow-through devices must be locked to prevent any sewage discharge into the water. This means securely locking Y-valves, which allows the boater to direct the sewage from the head either into the holding tank or directly overboard. NDAs do not prohibit the disposing of greywater or sink water.

3. SURVEY FINDINGS

3.1 RESULTS OF BOATERS' SURVEY QUESTIONS

During the summer and fall of 2005, 871 boaters responded to the anonymous boaters' survey, which is 21% of the boating population in the study area. Each survey question is listed and then the results of the question are presented in text and charts. Discussion of the results is in section 3.1.3. Both the survey that was mailed out to mooring holders and the online survey are in Appendix 7.

3.1.1 BOATERS' SURVEY ANALYSIS

Question 1. *How many years have you been boating?*

The largest number of respondents, 211 people or 24%, has been boating from one to ten years. Next, 20% (n = 174) have boated for 31 to 40 years, with a close 19% (n = 162) for 21 to 30 years and 18% (n = 156) for 11 to 20 years. Twelve percent (n = 106) have boated for 41 to 50 years, five percent (n = 45) for 51-60 years, while eleven percent has been boating for more than 61 years (n = 11).

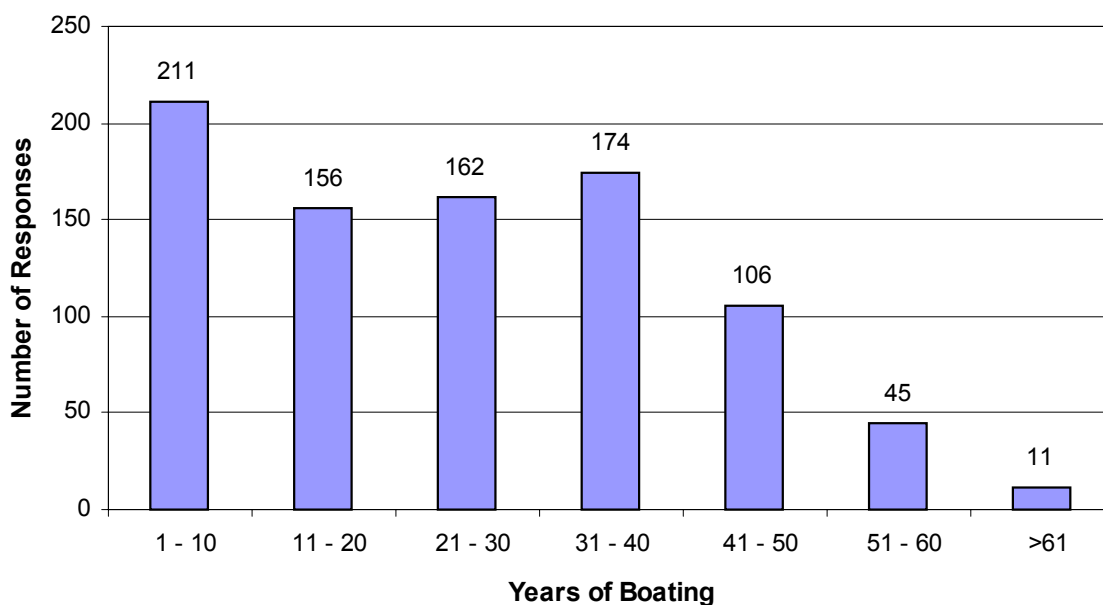


Figure 2. Distribution of boaters over number of years boating. N = 865.

Question 2. *Your boat's primary use?*

Ninety-seven percent of the respondents (n = 835) are recreational boaters. Less than one percent (n = 7) say the boat's primary use is commercial, while 2.4% (n=20) say they do both with their boats.

Question 3. Your boat's length in feet?

The most common boat length is between 17 to 24 feet at 35% of the respondents, followed closely by 32% owning 25 to 30 foot boats, and 26% having 31 to 40 foot boats. Two percent have boats sixteen feet or less, and 5% have boats longer than 40 feet.

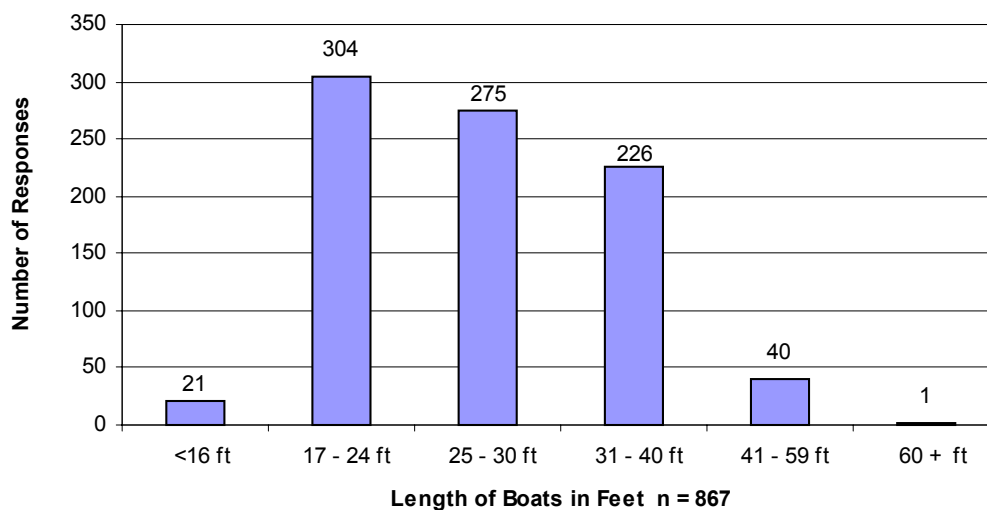


Figure 3. Distribution of boats by size category. N = 867.

Question 4. Type of boat?

Motorboats make up 61% of the survey (n = 524), and 39% respondents say they have sailboats (n = 337).

Question 5. Does your boat have a galley?

Galleys are on 60% of the boats and absent in 40% out of a total 860 respondents.

Question 6. What is the maximum number of people your boat can carry?

The majority of boats, 68%, can carry 5-8 people, and 20% carry between 9 to 16. Ten percent can carry four or less, and two percent from 17-25. Four boats can carry more than 26 people. N = 856.

Question 7. On average, how many people are onboard at one time?

Generally, 85% (n = 733) have four or less onboard at a time. Fifteen percent (n = 127) have 5-8 people onboard. Only one respondent frequently carries 17 to 25 people.

Question 8. When your boat is in the water, where do you typically moor or dock it?

Respondents wrote in the location of the boat for the summer, with 421 saying they were somewhere within Salem Harbor. In this breakdown, Salem Harbor includes the Marblehead side of the harbor (west side, Village Street), Palmer Cove, Pickering Wharf, South and North Rivers, Kernwood, Winter Island, Juniper Point, and Salem Willows. Beverly's 156 surveys come from the Bass River, Beverly Harbor, Danvers River, Tuck's Point, Lynch Park and West Beach. Danvers' 187 surveys cover boats in the Danvers River and Crane River. Five surveys came from Manchester, 23 from Marblehead (not in Salem Harbor), and five from outside Salem Sound. Twenty-seven people chose to leave the question blank, and 43 gave generic answers, such as mooring, river, or yacht club. Every yacht club and marina in the study area was covered by the survey returns as delineated on the map in Figure 1.

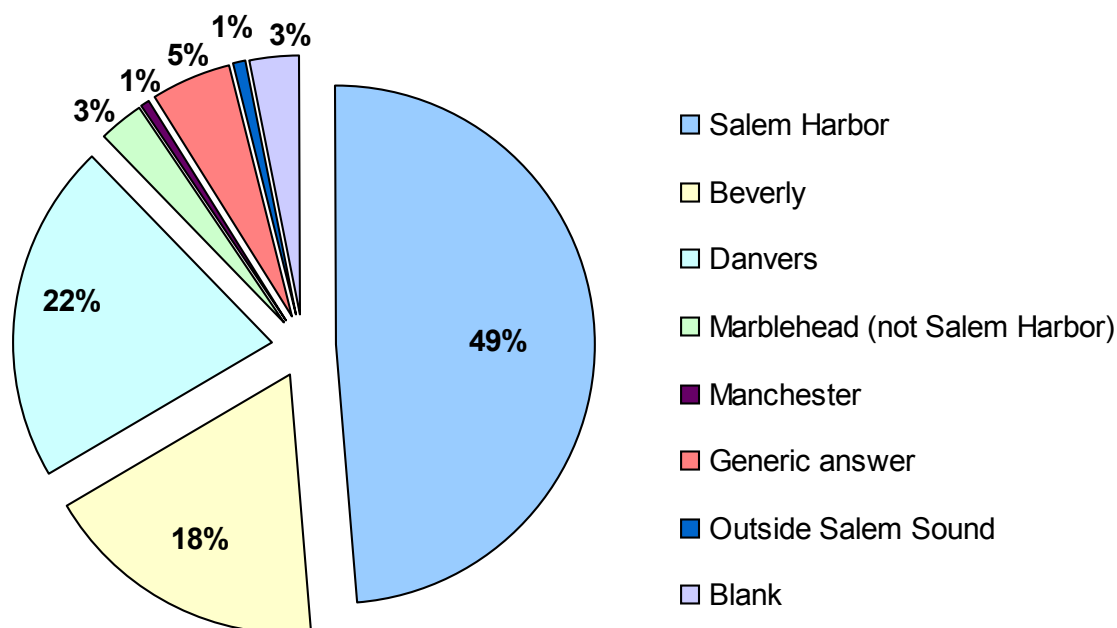


Figure 4. Percentage of survey responses based on boat location. N = 867

It appears that Salem Harbor boaters responded to the survey in greater numbers than other area boaters. However, the return rate was approximately the same for each community, just some locations received more surveys because they have more mooring holders. Approximately, half of the mailed surveys went to boaters in Salem Harbor. When the number of returned surveys per community is divided by the number of mailed surveys to each community, the return rate is a 20% for Salem. Nine hundred surveys were mailed to Beverly mooring holders or 22% of the total surveys mailed. Their return rate was 17%. One thousand forty-three surveys or 26% were mailed to people with Danvers moorings. Danvers' return rate was 18%.

	Surveys Mailed	% of Total Mailed	% of Surveys Returned
Salem	2100	52%	20%
Beverly	900	22%	17%
Danvers	1043	26%	18%

Table 1. Survey return rates between 20 and 17% per community.

Question 9. Do you “day trailer” your boat?

Only 5% (n = 41) day trail their boats; 95% (n = 823) do not. Seven people chose to leave the answer blank.

Question 10. How do you refuel your boats?

Seventy-nine percent (n = 232) fuel at a dock; 27% (n = 595) carry on their fuel, while 4% (n = 38) answered other.

Question 11. On average, how many days a year are you onboard your boat?

The majority of boaters (68%) spend less than 36 days a year onboard their boats. However, 22% say they spend 37 to 60 days a year onboard, which means they are on their boats between a third to two-thirds of the summer since the average boating season in Salem Sound runs from Memorial Weekend to Labor Day. Those who spend more than 61 days onboard make up only 11% of the survey respondents. This seems to follow closely with what the marina operators and harbormasters reported.

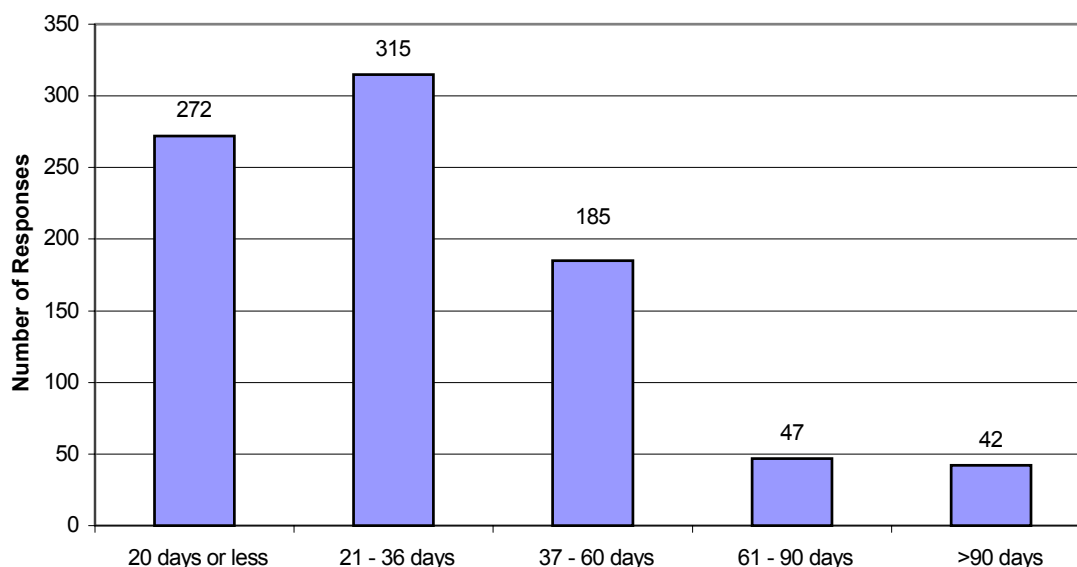


Figure 5. Distribution of boaters and the number of days spend onboard. N = 861.

Question 12. Do you live onboard?

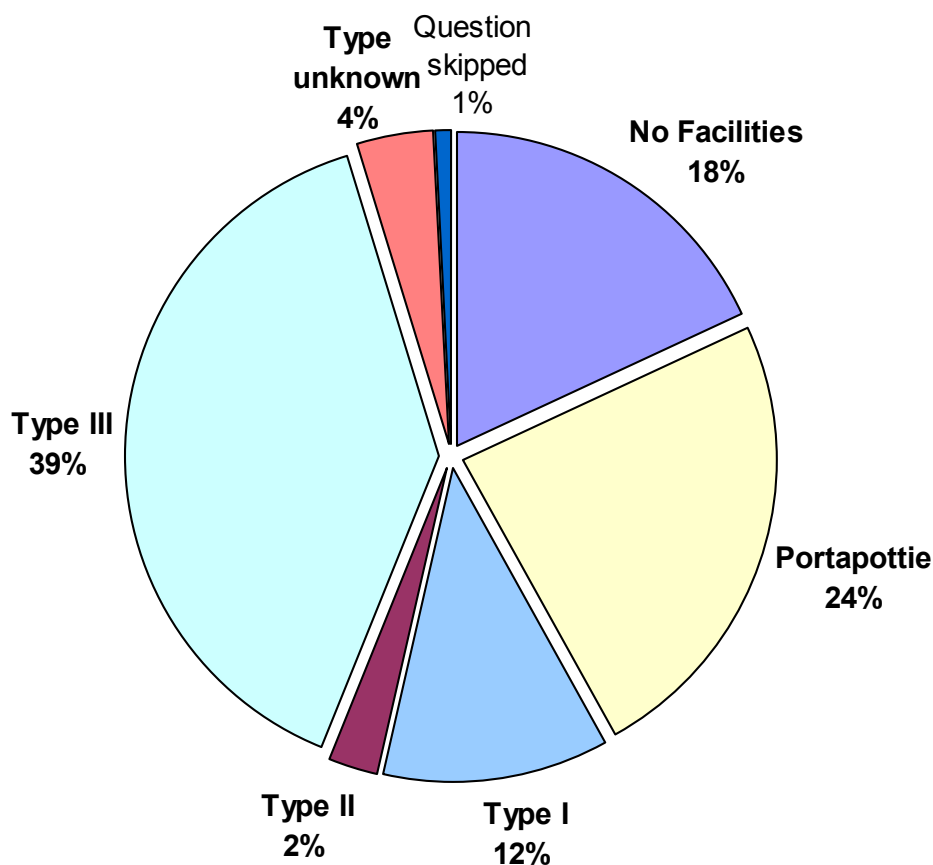
The results of this question corroborate the previous question's results. Five percent or 42 people say they spend the summer on their boats, while 95% do not. Only three people (0.3%) say they live on their boats all year. Out of a total 871 respondents, four people left the question unanswered.

Question 13. *Do you swim or fish where you moor or dock your boat?*

Most people, 537 respondents or 63%, do not swim or fish from their boats at the dock or on the mooring, while 321 or 37% do. Thirteen left the answer blank.

Question 14. *Do you have a head onboard and if yes, which MSD type is it?*

Of the boaters who responded, 81% report that their boats are equipped with a MSD or a portapottie. Of these, 39% report having a Type III MSD, and 24% have portapotties onboard. Only two percent report having a Type II MSD, while 12% have a Type I. Four percent say they have a MSD but do not know what type. Eighteen percent have no toilet facilities onboard. One percent skipped the question.



	Response Total
No Facilities	158
Portapottie	207
Type 1	103
Type II	21
Type III	340
Type unknown	34
Question skipped	8

Figure 6. Percentage and number of MSDs types onboard boats. N = 871.

Question 15. *When onboard, what percent of the time are you at the mooring or slip?*

Most respondents seem to go out on their boats to go motoring or sailing. Seventy-five percent (n = 643) say they spend less than 33% of the time at their mooring or slip. However, twenty-five percent spend greater than 50% of boating time at the mooring or slip. Fourteen percent (n=125) spend 50%; 7% (n=64) said 75%; while 3% (n=24) spend 90%, and one percent (n=5) say they spend 100% of the time on the mooring or slip. Therefore, almost 11% of the respondents, or 93 people, spend 75% or more of the time on their moorings or slips.

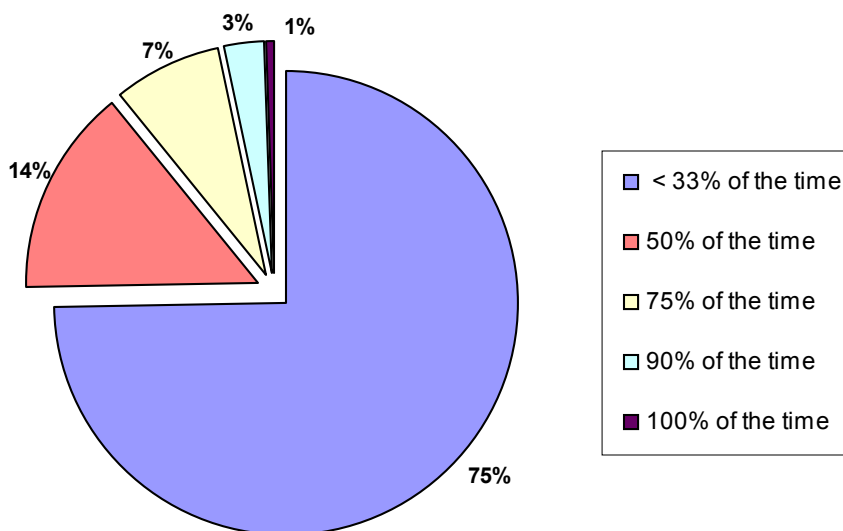


Figure 7. Percentage of time spent on the mooring or slip. N = 861.

Question 16. *Do your current practices include dumping sewage overboard?*

Seventy percent (n = 601) say do not dump sewage overboard while 13% (n = 112) say they dispose of treated sewage. Seventeen percent (n = 147) deposit untreated sewage as a current practice.

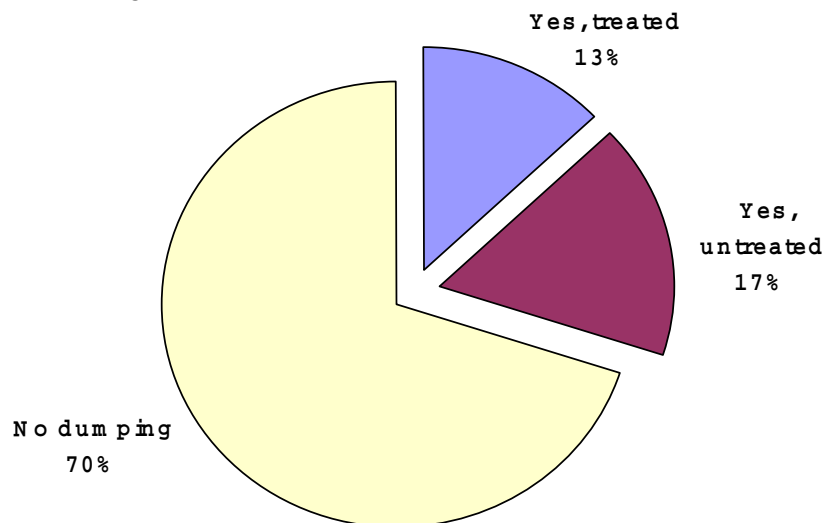


Figure 8. Percent that dump sewage overboard. N = 860.

Question 17. *If you answered yes to question 16, where do you dump?*

When asked where they dump, 277 people answered the question with 88% of them saying they dump beyond 3-miles of the coast. Fourteen percent (n = 39) say they do it within 3-miles of the coast, and three percent (n = 9) say they do it at the mooring or slip. Eighteen more responded to this question than those that answered “yes” to dumping sewage overboard. Nine marked more than one place.

Upon closer examination of this question, it became apparent that boaters are confused over the meaning of “treated” and “untreated”. Some owners of portapotties and holding tanks think the contents are treated, probably because of the chemical deodorizer that is added to the container. Almost 20% of the Type I boat owners who dump believe it is untreated.

Some boats with Type I or II discharge within 3-miles and at the mooring, but there are also boats with holding tanks, portapotties and no facilities that are discharging within 3-miles and at the mooring. Three surveys indicate that they dump in all three areas. Of those that say they dump at the mooring, four have holding tanks, three Type I, one Type II and one has no head. As can be seen in Figure 10, 55% of those that dump within 3-miles and/or at the mooring have holding tanks, portapotties or no facilities.

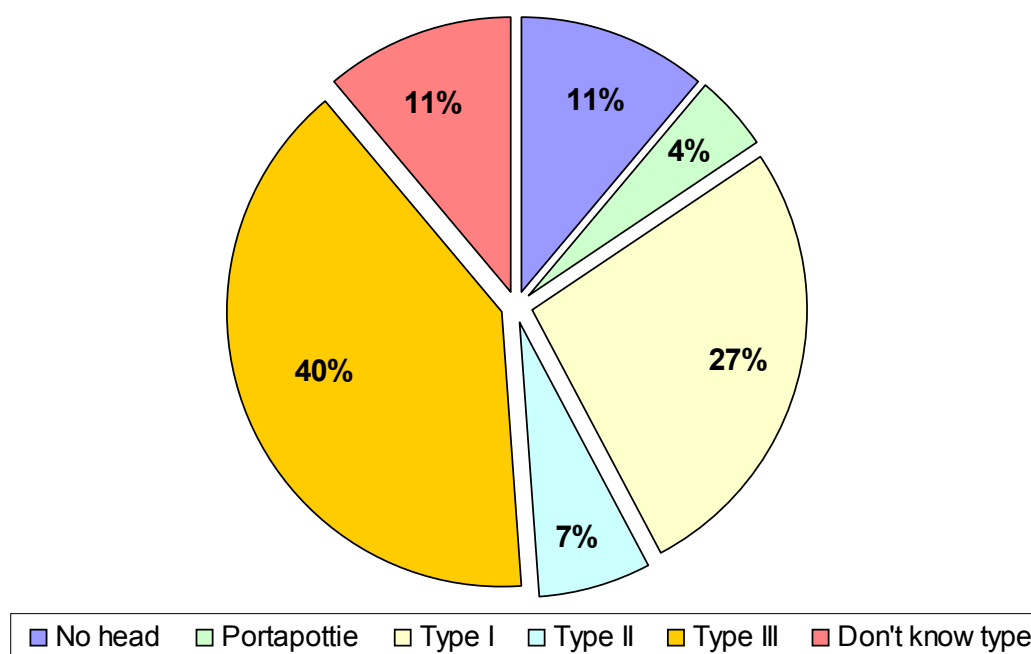


Figure 9. Percentage that dump within 3 miles and/or at the mooring. N = 45.

Question 18. *If you have ever pumped overboard within 3-miles of shore, the reason(s) was: (Check all that apply.)*

Of the 155 who responded as to why they pumped overboard within 3 miles, 53 chose “other” and wrote comments to explain. Thirty-five of these comments explained why the respondent does not dump. Besides “other”, 128 answers were checked. The unavailability of pumpout facilities received the highest percentage of responses at 35%, while 16% say they had equipment malfunctions, and nine percent had holding tank overflows while at sea. Eighteen percent are

owners of Type I and II who say it is okay to dump from their MSDs, and six percent checked that they see no problem with dumping overboard within 3-miles of the shore. Three percent say they did not know how to prevent flushing overboard. Twelve percent admit to not knowing when they are at least 3-miles offshore.

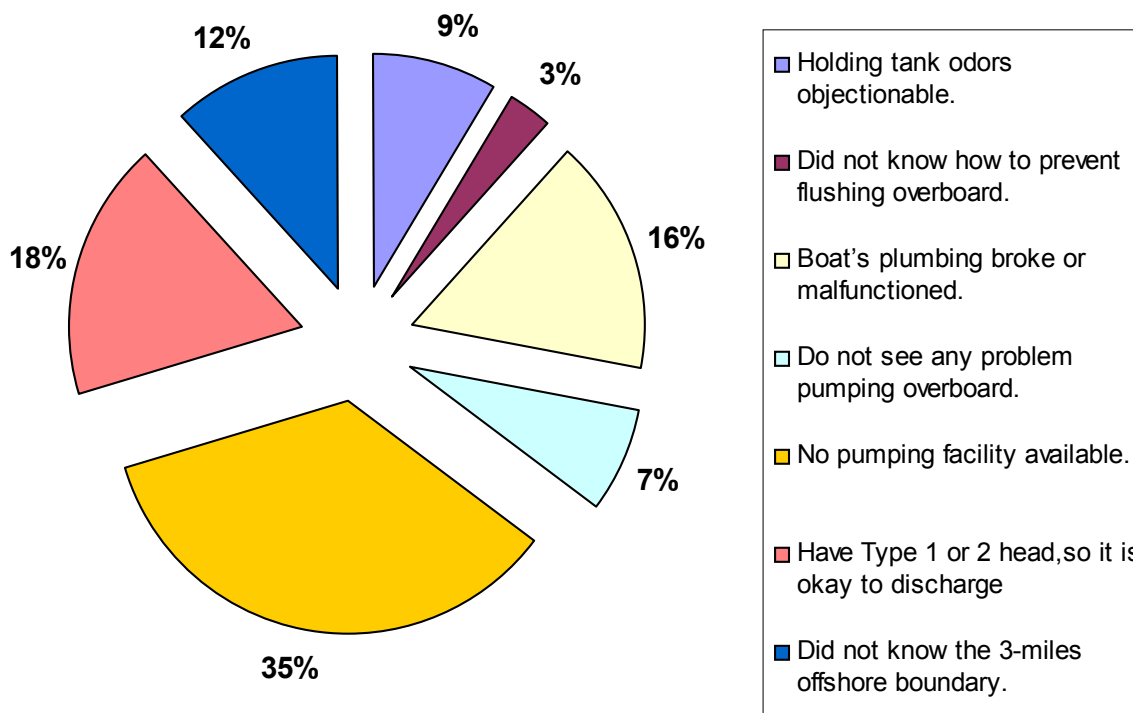


Figure 10. Reasons for dumping overboard by percent. N = 128.

Question 19. *Have you used local pumpout facilities?*

Less than half of the respondents have used pumpout facilities. Out of 820 surveys, 58% (n = 472) say they have not used local pumpout facilities, while 42% (n = 348) say they use local pumpouts. Fifty-one respondents left the question blank.

Question 20. *How many pumpout facilities are you aware of in your area?*

When based on the total number of people who answered the question (N = 672), pumpout facility awareness appears high with 90% knowing about one or more facilities. Fifty percent know of one pumpout, 36% two facilities, and 14% three or more facilities. More than likely, the boaters who know of many facilities cover a wide area during the boating season.

However, when the percentages are based on the total number of surveys collected (n = 871), the pumpout facility awareness percentage drops to 77%; 38% knowing about one pumpout; 28% knowing two; and 11% knowing three or more. This is because 199 respondents skipped the question.

Of the group that did not check an answer, 23 people wrote in “none.” Upon further examination of these 23 surveys, eighteen are from Salem, four from Beverly and one from Danvers. More details as to the relationship between MSD type and pumpout awareness are provided in Figure 12. and Table 2. People with no facilities have the least knowledge of pumpout facilities, as might be expected. Portapottie users have more awareness, while MSD owners have the most awareness, but still, 11% MSD owners (n = 51 out of 464) do not know of any pumpout facilities.

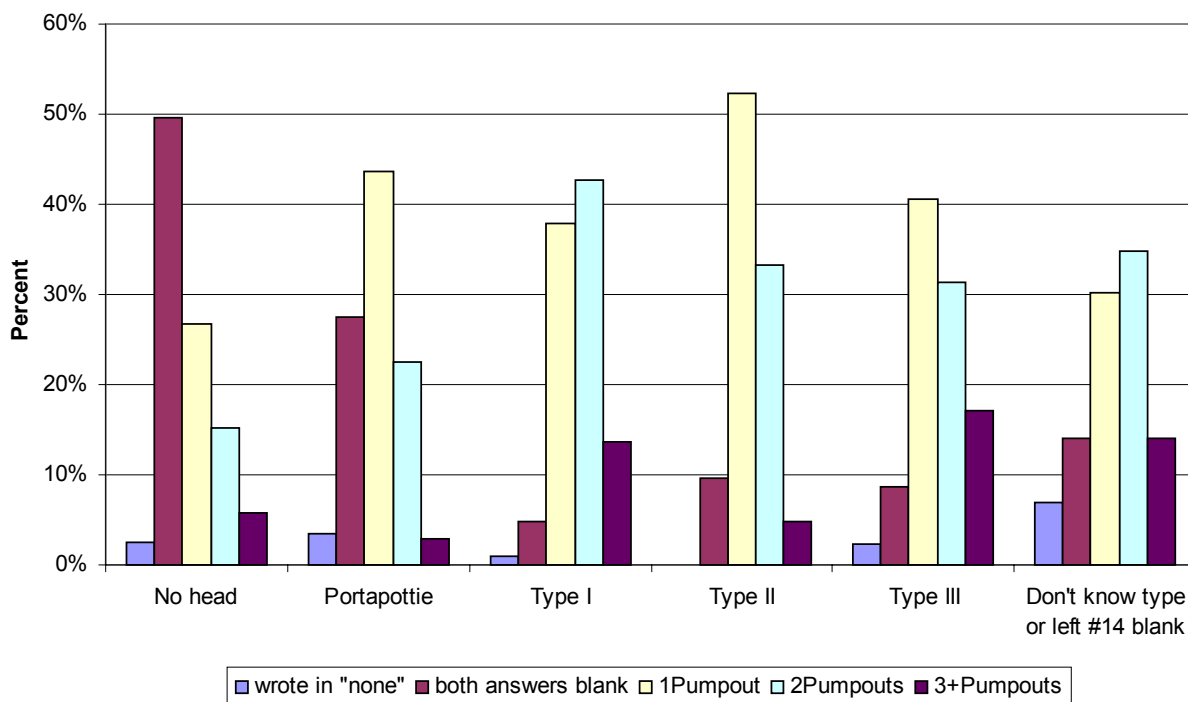


Figure 11. Percent of pumpout facilities awareness by boat's MSD type. N = 866.

Type of head onboard	Number of responses	Don't know of any pumpouts or left #20 unanswered	Know of one or more pumpout facilities in area
No head	157	52%	48%
Portapottie	204	31%	69%
Type I	103	6%	94%
Type II	21	10%	90%
Type III	338	11%	89%
Don't know type or no answer to #14	43	21%	79%

Table 2. Percent who knew of one or more facilities compared to those who don't know. N = 866.

Question 21. Which type of pumpout do you normally use?

When the survey asks which type of pumpout one normally uses, the responses were 15% at dockside, 27% by boat pumpout, and 10% say they use both. Once again, 355 people or 48% say they use “none, corroborating the results from Question 19. More boaters have not used pumpout facilities than have. The question was skipped by 125 respondents.

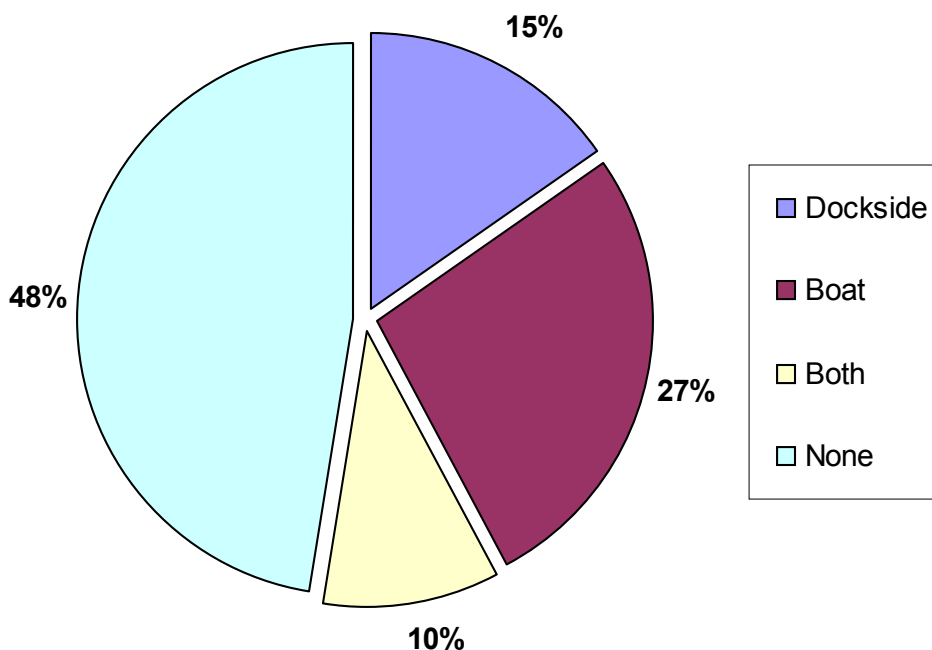


Figure 12. Percentage of pumpout facilities normally used. N = 746.

Question 22. If you answered None to question 21, would you consider using a boat pumpout?

Fifty-six more people responded than had answered “none” on the previous question. Of the 411 responses (47% of the total survey population), 280 say that they would consider using a boat pumpout in the future or 32% of the entire survey population. The 131 who answered “no” make up 15% of the total survey population.

Question 23. Please check any that describe your experience in the past two years.

Seventy-five percent of the respondents answered this question (n= 653), but 411 marked that “None apply.” Therefore, the population that answered this question is actually n = 242 or 28% of the total survey population. Multiple answers could be checked.

When asked to describe their experience with pumpout facilities over the past two years, 55% said pumpout facilities were not available. Thirty-eight percent said that there was no pumpout conveniently located near their boats, while 32% checked available but not functioning; 31% available but no staff; and 14% that pumpout was inaccessible (i.e. hose too short or water too shallow). Fourteen percent said that wait time was too long, while fewer people thought that the cost was too high (n = 22 or 9%). Seven percent said they do not know how to operate the

pumpout. They are probably referring to the Congress Street dockside pumpout since it is the only self-operated pumpout in Salem Sound.

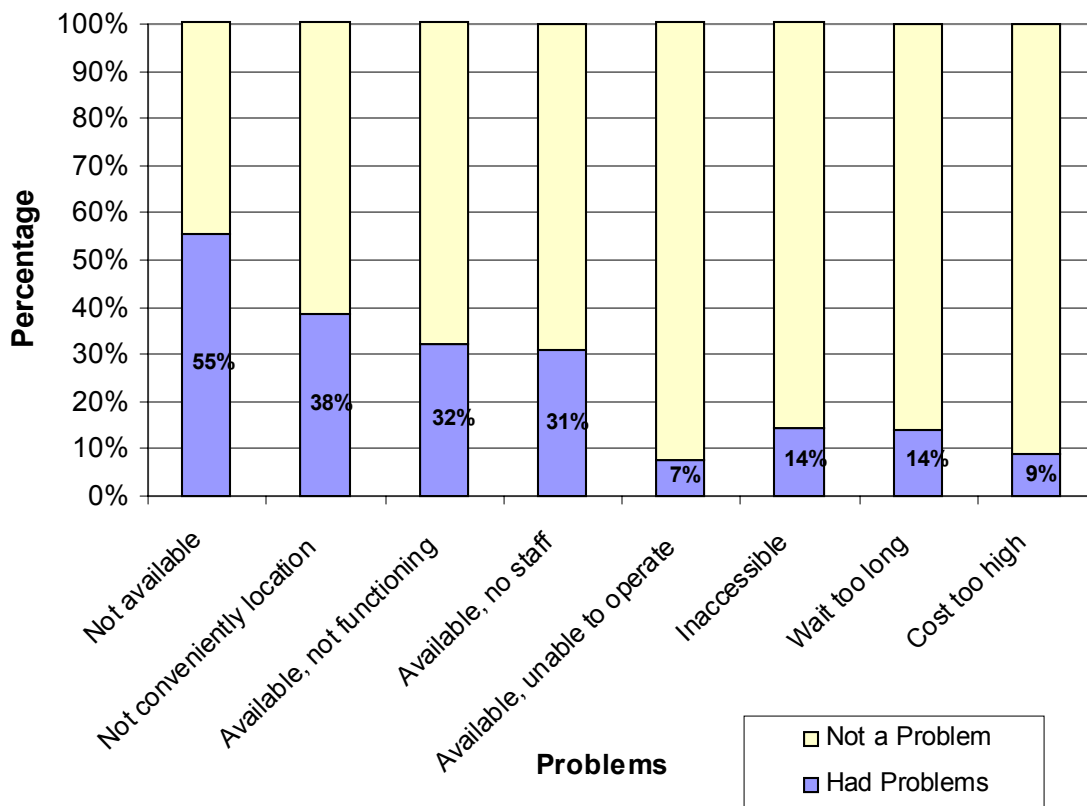


Figure 13. Percent of boaters who have experienced problems with pumpout services. N = 242.

Question 24. If you use a Portapottie, where do you dump it?

This question and the next address the use of portapotties. Since the current pumpout facilities in the evaluation area are not designed to pump portapotties, it is important to know how people empty them. The majority (56.6%) empties them at home, while 16.6% use the marina, and 8% use public restrooms. Nineteen percent chose “other” and most did not explain, but several said they use the yacht club facilities. Two surveys noted that they empty them three miles out, and one said they used the pumpout boat.

Question 25. Would you use a dock Portapottie pumpout if available?

When asked if they would use a dock portapottie pumpout, 79% or 346 people answered “Yes”. Since 139 more people responded than reported having portapotties (n = 207), a closer look was taken at this group of surveys regarding MSD type, with the thought that perhaps it was the boat owners with no facilities onboard who might chose to add a portapotties if there was a convenient method of disposal. However, there appears to be no relationship. MSD Type I, II and III owners responded that they would use a dock portapottie pumpout almost as frequently as those with no head or a portapottie. The question did not explain how this service would work so there may have been confusion over the actual service. What this response probably shows is that, in general, people are interested in convenient dockside services.

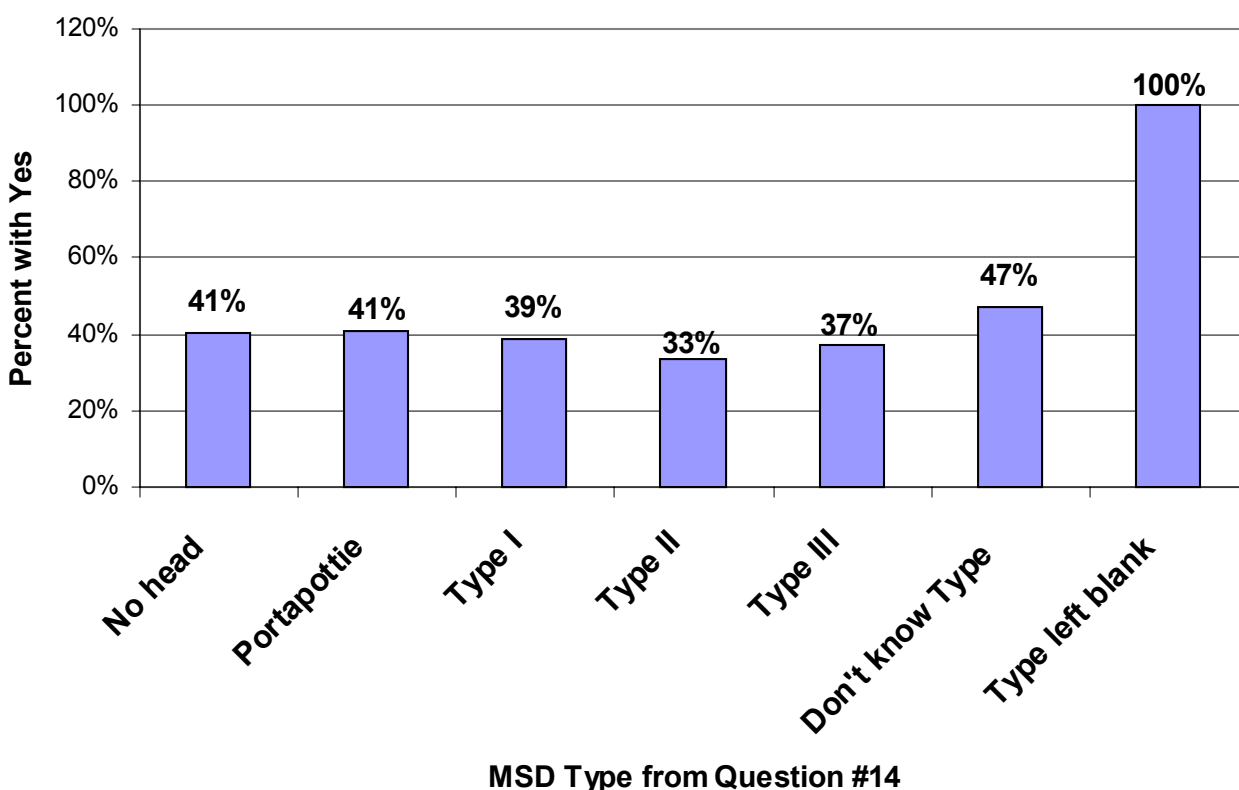


Figure 14. Percent of respondents who said they would use a dock portapottie pumpout if it was available compared by MSD type. N = 346.

Online Question 26. Do you ever use the “bucket” method to dispose of your waste within 3-miles of the coast?

The bucket method question was only on the online survey and therefore will not be further analyzed. However, it shows that only nine percent used the online survey option. The rest mailed the paper survey back to Salem Sound Coastwatch.

Question 26. *Do you think sewage from boats: check all that apply:*

This question was meant to evaluate boaters' understanding of the connection between raw sewage with health risks and beach closings. Response was high at n = 810 and most people selected more than one answer. Increased risk to human health and problems at beaches are the two greatest concerns, but 62% also checked that there is the possibility of increased toxins in the water from MSD disinfectants and deodorizers. Eleven percent says it has no affect because sewage waste becomes diluted and biodegrades. Six percent answered that disposing sewage overboard provides food for fish. This question brought many comments and some emails, which will be discussed in the next section.

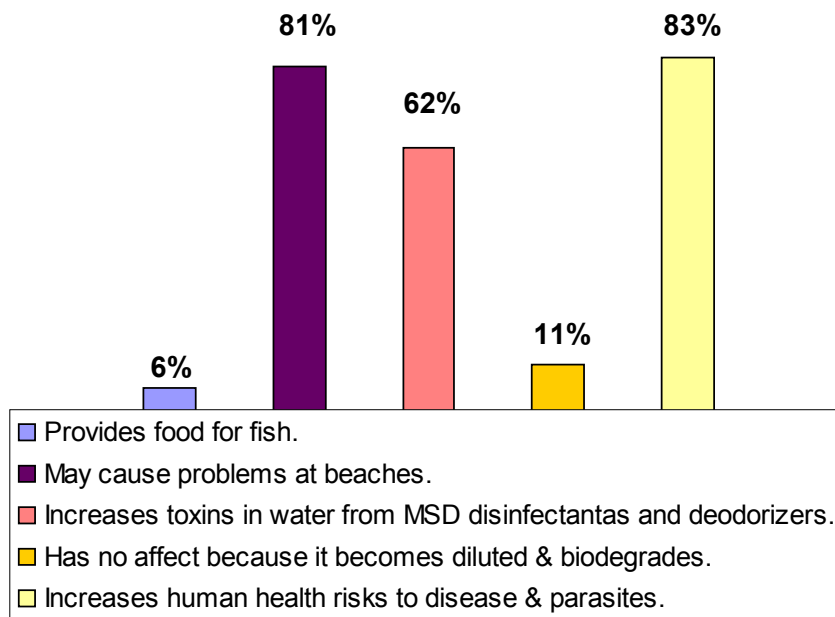


Figure 15. Percent of responses for each issue. N = 810

Question 27. *Are you aware of the federal law that prohibits discharging untreated sewage from vessels within all navigable waters of the U.S., Including coastal waters (within 3-miles of shore)?*

General awareness of the law is high at 96% of 825 respondents knowing of the federal law that prohibits discharging untreated sewage from vessels within all navigable waters of the U.S. including coastal waters (within 3-miles of shore).

Question 28. *If you saw sewage being discharged from a boat, would you report it?*

Asked if they would report sewage being discharged from a boat, 79% of 799 respondents say they would report it. Twenty-one percent (n=171) say they would not, and 72 respondents chose to skip the question.

Question 29. *If yes, who would you contact?*

Respondents wrote in the answer to this question. There were various renditions of fourteen contacts to whom respondents would report illegal sewage dumping. Most gave the harbormaster as the answer, followed by the Coast Guard and then, environmental police. Many say they have no idea who to call. Also, listed are the patrolling Auxiliary Coast Guard, Board of Health, marina, yacht club, dock master, Salem Sound Coastwatch, National Response Center, launch drivers, marine patrol, EPA, and DEP. Several say they would speak first to the boat owner or operator.

Question 30. *Would you support a “No Discharge Area” for Salem Sound?*

In a NDA, any discharge of boat sewage, even treated is prohibited.

Asked if they would support a NDA for Salem Sound, 86 % (n = 698) answered “yes” while 14% (n = 112) marked “no”. Sixty-one chose not to answer.

Question 31. *In your opinion, what additional sanitation services are needed or could be improved?*

Question 32. *Additional Comments:*

Comments are discussed in the next section.

3.1.2 COMMENTS FROM BOATERS' SURVEY

Forty-one percent chose to add one or two comments. Actually 767 comments were written. All comments were read, organized, and summarized into 22 groups. Comments made regarding other aspects of clean boating and pollution sources are in Appendix 1.

Several expressed dismay that the survey was being conducted because they believe Salem Sound to already be a No Discharge Area. Some of these boaters think the limit is 5 miles offshore, and others thought it should be greater than 3 miles. Others thought Salem Sound Coastwatch's efforts could be better spent on education and enforcement, rather than conducting a survey.

- "Salem Sound is within the 3-mile limit. Is it not already a 'no discharge zone'?"
- "Dumping is already illegal within 3 miles of shore, treated or untreated."

2. On the other hand, many thought that the survey was picking on the boating community. Some of these comments are from people who say they support a NDA for Salem Sound. It is important to listen to these comments because they may shed light on productive educational strategies. Many think the sewage treatment plants in Salem Sound are still contributing substantial pollution to the Sound.

- Compared to sewage being dumping into the water by the cities and towns, "boaters contribute next to nothing to the problem."
- "Why pick on boat owners who discharge a minimal amount of raw sewage during a very short (3-4 month) season when towns/cities dump millions of gallons annually & the Salem power plant puts thousands of tons of pollutants in the air? This is just another attempt to hassle boaters because the perception is they have money."
- "More sewage is dumped by surrounding towns than by boats."
- "Is there not a sewage discharge pipe leading into Salem Harbor? Surely this would add considerable pollution to the harbor. The main pollution to Salem Sound is the sewage treatment plant's pipe at the Haste Outflow and small pleasure boats at Misery Island. The main cure for Salem Sound should be extending sewage outflow line from the Haste 5 miles out to Halfway rock."
- "Salem discharges sewage in large volumes 24/7. This can easily be observed from the air. It is called 'the Bubbler', 'the hagic' and many flounder can be caught there. Targeting boats and not dealing with the sewage discharge is difficult for me to understand."

3. Others placed the blame for pollution on other sources. Appendix 1 has more listed.

- "Leave the recreational boater alone; it is the tour boats that are causing the problem."
- "The amount of sewage created by boats is miniscule, when compared to sewage create by nature herself, such as the waste created by seagulls which is spread over my car, boat and house."

4. Some of people, who reject a Salem Sound No Discharge designation, oppose further regulation and provide some good points that should be considered before applying for a NDA.

- "The current regulations are overkill and not needed except in congested marina areas where they have boat slips, not mooring areas which are usually self flushing with the tides and currents."
- "NDA is just another law that is expensive and hard to enforce."

- “The cost of lobbying and enforcement can be better spent on education and free pump-out solutions. People do the right thing when encouraged instead of threatened. More LAWS simply make do-gooders feel they are doing ‘good’. Practical, cost effective options will help us all. We want cleaner water too. Don't threaten us with rules - encourage us with options that don't drive us out of boating.”
 - “Very few pleasure boats have Type I or II MSDs--yet they are far better than raw sewage when discharged. A 'no discharge area' will not change the habits of those who discharge raw sewage within 3 miles, but will discourage boaters from buying Type I or II MSDs. A 'no discharge' law, if it has any affect at all, will be a negative for the environment.”
5. A few commented on MSDs, expressing a confusion that probably exists in the general boating community. Two made suggestions about repairs and upgrades.
- “I'd like to see a consensus on a MSD type. I would switch to a type if approved for discharge. The Coast Guard approves it but local authorities differ.”
 - “Need a type 2 MSD that works; also needs to apply to large vessels although politically difficult.”
 - “Subsidize cost for conversion on boats that do not have alternative closed system.”
 - “Link boaters to qualified individuals to do head repairs and upgrades.”
6. Boaters expressed the need for better onshore restroom facilities. Many find having bathroom facilities onboard too much of a hassle. A common boating practice is to use the shore-based facilities before getting on the boat and then waiting until one returns to shore.
- “More and better public restroom facilities onshore near docks.”
 - “Public (clean) bathrooms at harbors, e.g. Beverly (at gas dock), Marblehead, etc. and fresh water available at all docks (e.g. Congress Street).”
 - “More public shore-side restrooms in Salem, Marblehead at Village Street, Beverly at West Beach and Kettle Cove and at harbor master offices.”
 - “Floating restroom(s) that is funded through increased fees or pay per use.”
 - “Floating portajohns located on dock or float located at the following: Danvers River, Salem Harbor, and Beverly Harbor. Each float should be able to dock five boats and have five portajohns.”
 - “Don't use the head, not worth the effort.”
7. The idea of providing some kind of portapottie pumpout facility was well received.
- “A portapottie pumpout would be fantastic.”
 - “Marina prohibits the dumping of portapotties in their restrooms. I used to take it home, but that's a nuisance. Now, I go 3 miles offshore from Misery Island.”
 - “Need a portapottie disposal at Winter Island and Village Street dock. Portapottie discharge/pump areas may increase number of smaller vessels to use portapotties instead of other methods, i.e., dumping within the inner harbors.”
 - “A portapottie pumpout would be great! We often pump out at other harbors during vacation and at the end of the season at the boatyard.”
 - “Portapottie dumping stations @ Winter Island, Beverly Ferry way. (Both are locations where harbor masters have offices).”
 - “A closed-in bathroom type portapottie dump site, but not on the dock.”
 - “A system to facilitate users of portable heads to treat, discharge, rinse and return/recycle waste such as 'biobarge' which has not been in service for some years.”

8. Education of the boating community about marine sanitation was a big topic. Many wrote that better education was needed about local rules, regulations, and pumpout facilities.

- “As a new boat owner, I do not have any information on facilities, pumpouts, etc. Perhaps there should be pamphlets available when registering boats.”
- “Encourage people to use pumpouts via free info-sessions! It sounds silly, but the reason I have not used pumpout is that I purchased the boat recently, and it seems more hassle to pumpout than to dump (outside the 3nm, of course)!”
- “Five of my boat (owners) friends asked me where to pumpout. All these guys are local longtime boaters who just do not know that it’s free, easy and they come to you. You need to get the word out better, maybe with excise forms, mooring/slips, etc.”
- “I have never seen any signs posted at my club or at gas docks.”
- “Need information and instructions on how equipment works.”
- “Clarification to public that the discharge of small quantities of urine alone (without offal) is generally benign in a seawater environment.”
- “Information regarding “how much should I tip the pumpout boat? I usually don’t have cash when boating. Could I prepay?”
- “More awareness of pump station location and just how far out the ‘3-mile limit’.”

9. Suggestions as to how to go about educating boaters and advertising the services included:

- “Posting signs at marinas, yacht clubs, major docks, piers, etc. that explain how to get a pumpout!”
- “Info pamphlets, warnings, flyers with the pumpout boat # and hours would be very helpful.”
- “Mailings showing locations and schedule, contact info, how it works.”
- “Location of pumpout stations and law regarding ‘no dumps’ should be sent with municipal bills for excise tax.”
- “Classes for new boaters.”
- “More signage with days and hours of operation and how to contact on channel 9.”
- “Informational kiosks at public docks, take home brochures about sewage, pumpouts, health risks and general boating safety info. That is, safe boating practices, punishable misdemeanors and Coast Guard rights to inspect vessels at random, common courtesy, rights of way and recommendations.”
- “More brochures with the contact numbers to provide to boaters, done in conjunction with Coast Guard Auxiliary Safety inspections.”
- “Boats with berths should receive a sticker to post in boat with telephone number to call for pumpout or nearest dock pumpouts, hours & days available.”
- “Not sure but maybe a more ‘in your face’ info of all the dangers associated with discharging waste and trash in our ocean.”

10. Boaters also wanted more information on the water quality of Salem Sound and some suggested even paying for it.

- “More notification regarding water quality and safety of the harbor for fishing and swimming.”
- “Boaters could leave a donation to assist your organization in helping clean the waters.”

11. Some comments described boater's behavior and general awareness of sanitation issues.
 - "Five to twenty years ago boaters unknowingly were reckless with sewage. Today our harbor waters are cleaning up quickly. People are increasingly aware and responsible. When given obvious, easy, cost effective solutions they get motivated too."
 - Several mentioned that they have "stopped using the thru hull toilet years ago."
 - "In my sailboat, I couldn't always get far out during the day trips [to dump]."
 - "It is difficult to go 3 miles offshore with a sailboat with any regularity. If the pumpout boat is not running, it is tempting to pumpout within 3 miles and an outgoing tide."
 - "I rarely go > 3 mi offshore so I pump 1-3 miles sometime."
 - "Quite a few boats on Danvers docks never leave and should be required to use the pumpout service. I know, after checking with people, they just discharge at the docks. That is lazy, and they should somehow be monitored!"
 - "Human nature is much easier to change by making people feel guilty about behaviors vs. demanding a change in behavior. The first action of your town should be to make pumpout so easy and obvious that people feel guilty NOT using it. Public access to anything in Salem harbor by boat is so difficult and nonexistent; people probably don't know where pumpout stations are located. 1) make it simple. 2) educate, educate, educate, and your problems will improve. I applaud your efforts. Salem Harbor has gotten pretty dirty over the past few years."
12. Some people have one bad experience and they never try again.
 - "Salem pumpout never showed up in four attempts last year, 2004. I sailed far enough offshore that I will never try again."
 - "The cost is nominal & the equipment is fine....I would gladly pay more for more timely service."
13. A diver wrote about a diving experience.
 - "As divers, we have seen the effects of improperly disposed sewage. Mostly damage to life (lobsters w/burns caused (we believe) by sewage from land-based sources as well as toilet paper, etc., debris on bottom! Yuck!"
14. Several wrote about using pumpouts in other harbors, Nantucket, Block Island, etc. but not in Salem Sound. Their surveys showed they did not use local pumpouts. Others boaters pumpout where they refuel.
 - "I just got back from Nantucket and it has friendly and convenient pumpout but did not like the no discharge of gray water."
 - "I refuel only where pumpout is available."
15. There were a few, who suggest increased enforcement with monitoring of slips and mooring fields, boat inspections and increased fines.
 - "Inspect all boats, \$25 annual fee would cover the manpower requirements to complete this task."
 - "Increased enforcement, especially of cruise party boats and floating and moored docks of launch service operators."
 - "Spot-checking large boats in harbor by harbormaster;"
 - "Encourage whistle blowing."

- “Suspect raw sewage is being dumped. Violators should receive stiff penalties that are publicized to incentivize boaters to halt illegal discharges.”
- “A regulation plate (similar to oil & gas) sold in stores could be sold to boater to post in head area with discharge regulations. Boats could show a sticker (if they have berth) color coded to indicate type of MSD (whatever that means).”
- “Pumpout boats should be required to document the vessel's home port and mooring number information. The harbormaster could use this to see how often boats are using the pumpout service. It is unspoken policy for boatyards to pump holding tanks overboard as part of the decommissioning process at season's end. Boatyards claiming that they don't are either lying or the exception to the norm. The vast majority of yachts do not spend enough time at sea to need plumbing overboard. Holding tanks should be the law with very few exceptions.”

16. Many wrote comments similar to this one: “pumpout boats have been convenient and courteous- recommend!!!” However, there were still plenty of comments directed at the need for more pumpout services and better access. Suggestions were made about additional locations. Obviously, some boaters prefer motoring to a dock for pumpout, while others prefer the pumpout boat, especially if they do not need to be present.

- “If places were to do 'NDA', pumpout places should be at any fuel or regular dock to allow regular pumpout.”
- “Will agree to NDA as long as more facilities are provided including yacht clubs and marinas.”
- “City and town public docks should have pumpout stations. Marinas, yacht clubs and fuel docks should also have pumpout stations that are HANDY to use. Pumpout boats are sometimes very hard to contact and only work on a limited schedule.”
- “We do not have enough pumpouts. There should be one at EACH marina. The water in the north shore area is disgusting.”
- “A dock set up somewhere with longer hours and no charge for pumpout in Beverly Harbor.”
- “Pumpouts should be more available especially at Misery Island and at NO charge. I am under the impression this is a federally funded program and we should not have to pay for these services. I believe the fee discourages people from using it.”
- “More pumpout facilities at more locations. Village St., Browns Island”
- “Pumpout facility at SESD. Rear faces water. Needs dredging. Plenty of room for docks for this type of thing. If it's made as easy as it can be, people will be apt to do it.”
- “Boaters in Danvers think it would be convenient to be pumped out at the slip.”
- “The pumpout boat in Beverly and Salem should make even more rounds in the harbor to promote usage and become more visible.”
- “Marblehead Harbormaster provides pumpout at no cost -- a great incentive. However, the boat comes to the west shore [Salem Harbor] infrequently. Sometimes we wait more than a week for a request. A pumpout boat dedicated to the west shore / Salem Harbor region would be a great boon to local boaters.”
- “Perfect pumpout boat but it only does the Salem side of the harbor and will not go to the west shore and is not in use after and before summer.”
- “If pumpout boat would pump out our boat when we were not on board, we would use it.”

- “As many as there are gas pumps and give a certificate for everyone who uses it that would allow a boat owner to fill up his gas boat tax free.
- “Have pumpout-on-mooring service. Leave me a voice message when done.”
- “The pumpout boat may not be available due to demand or broken down. Extra boats will help. It is easier for a boat to come to us than us trying to dock 30+ feet of boat.”
- “Pumpout boat is more difficult than if I could pull up to a dock and do it myself. I have to wait for pumpout boat.”
- “Prefer a dockside pumpout available 24/7 over relying on a boat.”
- “Easier access to self-help pumpout. I'd like to see a floating (moored) pumpout dock in the harbor near the Salem Willows pier that a boater could tie up to and pumpout at. Perhaps run by the Harbormaster.
- “Self-operated pumpout stations on floats we can tie to would be useful/ if there are others besides Congress St. I have not heard of them.”

17. The Congress Street pumpout got several comments

- “Accessibility at Congress Street pumpout difficult to impossible. Doesn't work well at low tide because the head pressure (psi) is too hard to overcome.”
- “Open the South River to traffic; no more Hannah Glover blocking.”
- “The Congress St dock needs to be more accessible for self pumpout.”
- “In the eight years that we have had our last two boats, we have never been able to use pumpout facilities. When the facility was on land, we could never get to it due to tide or the fact that the Hannah Glover was in the way. Every time we have called for the boat, they have been 'unable' to provide service.”
- “Congress St. pumpout is too congested with docked boats at Pickering Wharf marina.”
- “Congress St. is too shallow, too crowded, and I don't know if it works or how I would operate it. Last time I tied at Congress St I got slime from the pier all over my boat. Is that the only pumpout?”

18. A couple made suggestions for equipment improvements.

- “The problem with Salem Harbor services, pumpout boat or Pickering Wharf dock is there is no way to flush out the holding tank and lines i.e. fresh water hose. I would pay for this service, if available.”
- “Once or twice I have seen and hailed the pumpout boat. I would use a pumpout facility if I knew of one available. In Bristol RI and other harbors, boats wanting a pumpout hoist an orange flag and the pumpout boat can come at anytime to pump that boat.”
- “Automatic pumpout-'on': signal when pumpout in progress required by law (like the back-up signal on trucks).”
- “Alarm should sound when pumpout is activated alarm should be inspected during safety check.”

19. Many comments discussed an extended pumpout schedule during the summer months and fall.

- “It should be operational, if only for a few hours, each day of the boating season. Otherwise, the temptation is too high for careless boaters to dump within the sound. We strongly advocate expanding the hours of the Salem pumpout boat.”

- “Beverly pumpout boat needs more weekend and weeknight evening hours (Sat and Sunday 8-8 weekend, day 4-8).”
- “Have the pumpout boat available until 8:00pm on weekdays. Weekend service is good but sometimes slow.”
- “Expanded pumpout hours (*even later Sundays), when available the pumpout boat is great.”
- “Pumpout boat only operates on weekends between Memorial Day and Labor Day. Should have some local Beverly facility that operates 7 days and for more of the season.”
- “Open later in the fall.”
- “I keep my boat in until November 1 usually and the last few years have had to go to Boston or Gloucester to get pumpouts after the middle of September. There are still a lot of boaters out there, and it’s a pain to have to travel all that way to stay within the law. My boat does not have the option to dump 3 miles out so it is important to keep the pumpout services available maybe until the middle of October.”
- “Year round pumpout. I need to use the shore head most of the winter.”
- “Hire retired people for pumpout operators so season could be extended.”
- “Need to be able to schedule a pumpout during the week when the boat is unoccupied. If come to my mooring and pump it out during the week. I would schedule by email prior to Monday AM- pumpout prior to noon Friday.”
- “Some times, have had to wait awhile. I don't like to devote much time waiting for this service, but I should just get over it. It’s a very useful service.”

21. Commercial vessels

- Pumpout services need to “address the larger luxury cruise lines and commercial fisherman.”
- “I have witnessed from my vessel two commercial vessels from Salem Harbor passing each other in the middle of the Sound and as they passed one of the vessels emptied their holding tank. There was no way to know which vessel as they passed within a boat length of each other.”

22. More than one person realized that improved services would cost more.

- “I know many, many boaters who dump overboard + think nothing of it. More pumping stations + better enforcement = \$\$\$”

3.2 DISCUSSION OF BOATERS' SURVEY

Among the survey population, awareness of the federal law that prohibits the disposal of untreated sewage within three nautical miles of the shoreline is high (96%) as is the awareness (>80%) that the release of untreated sewage may increase human health risks to disease and parasites and cause problems at area beaches. This high awareness of sanitation issues is matched by strong support for Salem Sound becoming a No Discharge Area with 86% of the survey population in support. Fifty-eight percent of boats in the study have marine sanitation devices, and another 24% have portapotties. The boaters who use the pumpout facilities have few complaints with only 28% of the respondents saying they had experienced problems with pumpout services in the last two years. Lack of availability and inconvenience are the greatest obstacles to getting a pumpout, while cost appears not to be a major concern. The five CVA funded pumpouts are free while the one private facility charges \$10. However, many boaters admit to not knowing about the facilities available to them. When pumpout awareness is compared to MSD type and sewage dumping practices, it appears that there is definitely room for improvements in the marine sanitation practices of Salem Sound boaters.

Pumpout facilities awareness and usage is not as high as it could be. While 77% know of one or more pumpouts, 11% of boat owners with MSDs do not know of any pumpout facilities. The survey shows that more boaters have not used pumpout facilities than have. Less than half of the respondents (42%) have used the pumpout facilities in Salem Sound. When asked if those who have not used a pumpout (58%) would consider using such a service, almost half of the survey population answered the question. Thirty-two percent saying "Yes", but 15% answering "No".

The results are similar when boaters' sewage dumping practices are examined. Seventy percent say they never dump overboard. Of the 30% who do dump, 88% of them say they do it beyond three miles, but respondents were able to select multiple answers for this question and some selected all three choices: beyond 3-miles of coast, within 3-miles of coast, at mooring or slip. Dumping within 3-miles of the coast and/or at the mooring or slip is taking place by at least 15% of the survey population. Boats with Type I and II MSDs can legally discharge sewage into Salem Sound since it is not a designated NDA, but the dumping is not restricted to boats with Type Is and IIs. Fifty-five percent of those who dump within the Sound have holding tanks, portapotties or no facilities onboard.

Reading through the boaters' comments sheds some light on how the fifteen percent who are dumping sewage within Salem Sound may be thinking. "The amount of sewage created by boats is miniscule;" or compared to sewage being dumping into the water by the cities and towns, "boaters contribute next to nothing to the problem." Six to eleven percent also think that sewage disposal provides food for fish and/or has no affect because it becomes diluted and biodegrades. Informational materials need to be able to respond effectively to this thinking if it is hoped to change behaviors.

The survey results also identify several areas of confusion among the survey population. Some boaters do not know what type of MSD they have onboard, which makes maintenance difficult. Type I and II MSDs require proper maintenance to effectively reduce fecal coliform levels to the sewage treatment device standards set by EPA (see page 10). If they are not maintained properly, within two years of a new installation, they are probably not functioning fully.² Several respondents discussed this problem in their comments suggesting that there might be a program to subsidize the cost of converting boats to closed systems or at least, providing boaters with a list of qualified individuals who could do head repairs and upgrades.

There is also confusion between what constitutes treated and untreated sewage. Twenty percent of MSD Type I owners think the effluent from the MSD is untreated, while some boaters with pottapotties and holding tanks responded that they were dumping treated sewage. Not knowing when they are three nautical miles offshore is another problem that some boaters acknowledged.

Twenty-four percent of boats surveyed use portapotties, but there are no facilities within the study area that are designed to pump portapotties. In fact, many onshore facilities have the policy that pottapotties cannot be dumped in public restrooms. Most are emptied at home. However, when asked if they would use a dockside portapottie pumpout service, almost 40% say they would use one. Some boaters wrote that they had used such facilities in other harbors and would welcome it in Salem Sound. A dockside pumpout cart or dump station with fresh water for rinsing, cleaning and refilling received a positive response from all types of boaters, perhaps because boaters are generally interested in convenient dockside services. Over and over it was written, make it easy, convenient and readily available and pumpout services will be used.

² Per conversation 12/8/05. Peter Burlinson. Epson International

The other facility that does not seem to be readily available for boaters is public restrooms. Many wrote that it is too much of a hassle to have a toilet on their boats, and 18% say they have no head onboard. Therefore, having conveniently located restrooms at or near docks is very important. This subject was not addressed by any survey questions, but many wrote in comments. Areas that seem to be in particular need of restrooms are Village Street public dock in Marblehead, Congress Street in Salem and the Beverly gas dock. Several made suggestions to set out floating porta-johns, which may be funded through the CVA program.

Many of these issues can be addressed through education by providing more informational materials and trainings. However, education needs to be on going since the area has historically been open to new boaters because moorings and slips have been available, unlike some harbors. Nearly one-fourth of the boaters in the study have boated for less than ten years. Unless circumstances change, it may be expected that every year Salem Sound will have new boaters unfamiliar with the area, its facilities and marine sanitation practices.

4. INTERVIEW FINDINGS

4.1 SUMMARY OF HARBORMASTER INTERVIEWS

The four harbor masters from Marblehead, Salem, Beverly, and Danvers were interviewed over the course of the study period. Although each has a different assessment regarding the extent of illegal sewage dumping taking place, each harbor master supports making Salem Sound a No Discharge Area. All harbor masters have zero tolerance policies when it comes to dumping sewage within 3-miles of shore, but none have enforced the law or seen anyone engaged in dumping sewage. Identifying illegal sewage discharge and enforcement are very difficult. One harbor master expressed the frustration when he rhetorically asked, "How does one enforce the law when the outlet is underwater?"

The harbor masters do not currently know what MSD types the boats in their harbors have, and two of them have little interest in knowing, while the other two said they could add a question to the mooring permit to obtain this information. However, in the current situation, it is difficult to see how this information would be used, since boarding a boat to inspect the MSD has never taken place, and the harbor masters seem reluctant to add this to their duties.

Most think the waters of Salem Sound are cleaner than in the past, and they attribute some of this to the fact that the boating public is better educated on this issue; manufacturers have produced more effective equipment, and there are more new boats with improved equipment. It was also noted that having the pumpout boat and dockside facilities for the last 12-13 years has helped. They receive few complaints from the boating community regarding illegal sewage discharges. The Danvers harbor master does believe that the water condition has worsened because of the increased number of boats in the Danvers River and the sedentary nature of some of the boaters. The survey results confirmed that one-quarter of boaters spend more than 75% of their boating time at the mooring or dock.

Advertising the pumpout facilities and hours is done in phone books, on their websites, on the pumpout boats, at the dock master offices, yacht clubs, and marinas. They receive inquiries over the phone and distribute the CVA/CZM pumpout/tide charts.

When asked if their pumpout stations are underused or operating at full capacity, there was no clear consensus. The Salem pumpout boat operates only on weekends, Saturday and Sunday

9:00am to 5:00pm (later if boats are waiting). In 2001, the boat operated seven days a week, but on the average, they only received one or two calls during weekdays. Therefore, the seven-day service was not continued after 2001, since funding is always an issue. Beverly's pumpout boat runs 8:00am to 4:00pm Friday through Sunday, while the Marblehead boat operates on the weekdays by appointment. Occasionally, Marblehead will pumpout a boat on the weekend, if they are not busy with other more matters. If funding were available, harbormasters could see extending the days and hours that the pumpout boats are staffed.

Danvers applied for a CVA funded boat in 2001/2002, but when the application was approved just before the end of the fiscal year, the Board of Selectmen turned down the grant because of financial issues. There is now general receptivity from the harbormaster, public health director, boating community and the Danversport Yacht Club for the submission of another application.

Danvers is serviced by the only private pumpout in the area. The Danversport Yacht Club runs a pumpout station at its fuel dock and one at the lift dock, seven days a week. There are currently two CVA funded dockside pumpouts in the study area. Salem has a fixed dock pumpout at Congress Street that is self-operated. Several problems with this station were discussed by the harbormasters. This facility is the only self-operated station, the water level is too shallow, especially at low tide, for most boats; and the area is congested with launch services working off the public dock and the large boats that are docked on the opposite side of the South River channel. Beverly has been waiting for a fixed pumpout station to be installed at the Public Dock, which should be operational in 2006. Beverly Harbor, being at the mouth of the Danvers River, experiences a strong current and thus needs either experienced pumpout boat operators or a fixed station. The Beverly harbormaster believes that the fixed station at the public landing will make it easier for boats to be pumped out. It appears from the survey results that many Danvers boats use the Beverly facilities. Marblehead also has a fixed station at its old headquarters at Crocker's Marina in Marblehead Harbor. This facility seems to also have reliability problems. From that survey results, it does not appear that boats moored in Salem Harbor (Marblehead side) go over to Marblehead Harbor to be pumped out. The Marblehead harbormaster would like to add another dockside facility, but finding a suitable location has not been easy. Any new station would need to pump the sewage uphill to the sewer main, which would add considerably cost to the installation.

Harbormasters would rather educate boaters than fine them, and all would consider employing better signage and distributing educational handouts. Including an educational brochure in the mooring permit mailing in March is an option that Salem, Beverly and Danvers harbormasters are willing to consider. Marblehead's mooring permit mailing does not have room for any additional material, but there might be other ways to deliver the information, for example, distributing the material to the many yacht clubs in Marblehead or involving the power squadron and Coast Guard Auxiliary.

4.2 SUMMARY OF OPERATOR INTERVIEWS

A pumpout operator was interviewed from each community. No one thought that illegal sewage dumping was a serious problem, probably because no one had seen dumping. One operator said that he believes it is happening. Most have regular customers and can spend most of a day pumping out boats in a particular area or at one marina, while there are other areas of the harbor that rarely call for service. The weekend of July 4th is the busiest time, and it might prove helpful to advise boaters to get a pump out before a busy weekend or holiday. Also, Sunday seems to be the busiest day, and the operators report staying late to service waiting customers. The Salem operator tells of being followed around the harbor and flagged down for a pumpout.



**KEEP OUR
WATER CLEAN-
USE PUMPOUTS**

One of the problems is that with the current schedule and number of boats, there is no down time for pumpout operation. People get annoyed if they have to wait and complain about having to wait. Also, with the current Salem and Beverly schedule there is no way to accommodate boaters who want or need pumpouts during the week or evenings. The Beverly operator has also received complaints about the cleanliness of the shore side porti-johns, which are cleaned only once a week.

On the whole, they felt the equipment and boats have been reliable. They try to keep up with preventive maintenance, greasing the fittings, checking the oil and spark plugs, because if there are problems, it can be dirty, messy, and dangerous. Kevin DeLorenzo of Danversport Yacht Club said that running the pumpout is not a money maker because they are always replacing something: tips and nozzles at end of the hose, \$60 for a solenoid and 60-foot hoses that only last a couple of years and cost \$6 a foot to replace. The dockside facility at Crocker Marina in Marblehead has been inoperable about fifty percent of the time this past summer. The Marblehead pumpout boat has to go over to Salem's dock facility at Congress Street to discharge,

but the boat can only go in at high tide. This is also where the Salem boat discharges into the sewer main. Even though Congress Street pump has been unreliable for boaters, the pumpout boats can successfully use the hook-up because they use the pumps on their boats to discharge.

The operators had some good ideas for increasing awareness among boaters and felt that it was needed. One mentioned that he is still receiving calls in August from boaters who want to know how they get a pumpout done. One thought was to have the pumpout services discussed in boating classes. They suggested increasing the number of signs in the area, placing signs at fuel docks at Jubilee and Port Marine in Beverly, and at the Kernwood public landing (Danvers River, Salem). Also, signs on Beverly's old pumpout dock, on no wake floats and on the Salem-Beverly bridge pylons would provide good visibility. It was noticed during the interviews that there was room for improvement on the pumpout boats themselves. Signage that advertises the service and hours would be helpful on the pumpout boats. Also, the Congress Street facility has signs with the CVA logo but does not have a sign that shows boaters how to use it. This should be fixed.

Salem and Beverly generally hire college students to work the pumpout boats on the weekends, while Marblehead hire older, perhaps, retired people or the assistant harbormasters will run the boat. The major boating season goes from Memorial Day to Labor Day, but boats are still in the water into October or later. Getting boats pumped in the late fall is problem and of course, there are no pumpout services available over the winter.

4.3 SUMMARY OF MARINA INTERVIEWS

Four marina operators were interviewed. None think sewage dumping by recreational boaters is a serious problem, and most believe it is not taking place in their marinas. They all have a zero tolerance policy when it comes to dumping sewage, but none have it spelled out in their slip lease contract. This is another place where the rules and what are the acceptable practices should be spelled out more clearly for the boaters.

None of them collect information on the types of MSDs in their marinas and, like the harbormasters, do not want to know. If there is a reason for knowing, for example, they are asked to fix the head on someone's boat, then they will find out what type it is. Only one said he allows portapotties to be emptied in his restrooms. Everyone else has the policy "Take it home."

They believe the pumpout services are good and being used. They do not seem to get complaints about the pumpout service, but rather are asked when and how it is working. They are a good intermediary and should be used more to communicate with boaters about pumpout services.

Two marinas think the schedule needs to be extended with more hours and a longer season if possible. There is a “mad rush” to get pumpouts during Columbus Day weekend before boats are winterized. November 1st is the official winter season at some of the marinas. One marina has twelve boaters that live onboard during the winter, but because the boats still need to be winterized, he believes they all use the shore-side restrooms.

Danversport Yacht Club, the only one that provides own pumpout services, would welcome a town-owned pumpout boat in Danvers. Three favor a NDA for Salem Sound, but one does not because he does not think it will not change boater behavior. However, there is some confusion as to what is currently legal and what a NDA would actually do. The marina operators should be included in any actions that result from this study. They could be allies and resources in reaching the boating community.

5. RECOMMENDATIONS FOR MARINE SANITATION PRACTICES IN SALEM SOUND

No one wants to boat in dirty water. The marine sanitation message should be proactive, staying energized towards the goal of clean water. If pumpout facilities are convenient, free or inexpensive, and easy to access without a long wait, boaters will dispose of their sewage in the proper manner. However, it is clear from this survey that Salem Sound can improve its facilities, schedules and boater awareness of pumpout facilities. To achieve change the entire boating community should be involved: the recreational and commercial boaters, harbormasters, marinas, boatyards, and yacht clubs. Salem Sound Coastwatch looks forward to working with all these diverse groups to achieve meaningful improvements. SSCW recommends that a Salem Sound Working Group be established for a minimum of two years to discuss, prioritize the recommendations and begin implementation of the selected recommendations. The Group should examine the feasibility and implementation possibilities for infrastructure improvements and boater education. Then, it should be determined who will take the lead on each recommendation that makes it to the action list. The Group should represent all of Salem Sound and include representatives from the harbormasters and health departments from the municipalities of Marblehead, Salem, Danvers, Beverly and Manchester, marinas, yacht clubs, Salem Sound Coastwatch, Coast Guard Auxiliary, and Power Squadrons. State and federal agencies (CZM, CVA, EPA) should be used as resources. It may also be worthwhile to talk to people who were members of the South Shore Working Group from 2002-2003 and visit areas that developed model facilities, such as Marion MA.

The following recommendations came from survey comments, discussions with harbormasters, pumpout operators and marina owners/operators, CZM's Massachusetts Marina Environmental Guidebook, and Salem Sound Coastwatch. There has not been any attempt to prioritize the recommendations at this time.

1. Pumpout facilities and schedules vary for each community. An evaluation by community and for the region should be undertaken to determine ways to improve services.

Area	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Beverly Pumpout Boat					8 am - 4 pm	8 am - 4 pm	8 am - 4 pm
Danversport Yacht Club dock	8 am - 5 pm	8 am - 5 pm	8 am - 5 pm	8 am - 5 pm	8 am - 6 pm	8 am - 6 pm	8 am - 4 pm
Marblehead Pumpout Boat*	9 am - 5 pm	9 am - 5 pm	9 am - 5 pm	9 am - 5 pm	9 am - 5 pm		
Salem Pumpout Boat						9 am - 5 pm	9 am - 5 pm

* west shore - Salem Harbor by appointment only

Table 3. Schedule for pumpout boats in the study area and the one private dock facility.

- Examine pumpout schedules in each community and see how each can be improved. Look at the schedule for the region of Salem Sound to see how easy it is for boaters to reach a pumpout facility. It appears boaters will travel to get to a convenient working pumpout.
- Discuss pros and cons of owner onboard pumpout policy. Both are practiced in the evaluation area.
- The radio can get busy on weekends. Implement other ways for boaters to request a pumpout. Evaluate methods for scheduling pumpouts other than call and wait or following the pumpout boat around the harbor, e.g. sign-up sheets, emails. Determine if and what forms and/or liability waivers are necessary.
- Improve access to Congress St. dock self-pumpout in Salem. Make sure there are directions and a phone number if problem arises.
- Explore ways to improve facilities at Village St for the Marblehead side of Salem Harbor.
- Look at areas where pumpout facilities could be added. Survey respondents gave suggestions as to additional locations, but dock facilities must be able tie in to sewer mains, which can be a challenge along the coastline.
- Support Danvers if it decides to add additional pumpout facilities, i.e. pumpout boat, dock at the town-owned Crane River Marina.
- Explore idea of a dock facility at SESD.
- Determine if there are any reasonable options for Misery Island and Browns Island.
- See if there is a way to provide freshwater for flushing holding tanks, lines and portapotties.
- More funding for pumpout maintenance (a contingency fund) to avoid repair delays.

2. Many boaters in Salem Sound do not know about pumpout services. Survey results estimates that at least a quarter of the boating community do not know any pumpout facilities. Eleven percent of boaters with MSDs Type I and II do not know of any pumpouts. It is essential that visibility for the existing facilities and operating hours be increased to build boater awareness of pumpout facilities

- Advertise at marinas, yacht clubs, harbormaster offices and on their websites pumpout information.

- Improve signage on pumpout boats and dock facilities; orange flags and CVA logo
- Have buoys directing boaters to pumpout facilities.



- Fly pumpout flag on boat and manned dockside when in operation.
- Have a system in place to redirect boaters to alternative facility so if one is too busy, broken or not available. Let boaters know they have other options, than dumping.

3. Increased education will help to increase visibility and awareness, but the many different options should be carefully studied to determine the best use of resources.

- Boating classes, such as ones by the Power Squadron, should include regulations, reasons for not discharging into waters and best practices for marine sanitation.
- Send out pumpout information including a Salem Sound map designating 3-miles offshore in mooring renewals or other mailings.
- Make sure boaters understand the level of treatment being conducted at SESD (South Essex Sewer District) and the water quality of the effluent at Great Haste outfall.. Boaters can no longer use SESD as an excuse for their own dumping within the Sound.
- Inform recreational boaters about the oversight by health departments, Coast Guard, harbormaster on commercial vessel discharge.
- Provide boat owner training on how MSDs work and how to keep them working. Also explain how to use self-service pumpout stations.
- Encourage boat owners to use holding tank additives to help breakdown holding tank contents. BMP 6³
- Promote the use of non-toxic, enzyme-based, biodegradable cleansers and deodorants that do not use formaldehyde in holding tanks. BMP 12
- Mail out stickers for boaters to post in their boats with telephone number to call for pumpout, location of nearest dock pumpouts with operating days and hours.
- More education: floating key chains with pumpout message.
- Provide education at boater registration, gas docks, and yacht clubs, in newsletter, meetings, and websites.
- Enlist Coast Guard Auxiliary, Power Squadron and others.
- Let boaters know that they should contact the local Coast Guard if they see any vessel sewage discharge violations.

4. Since 24% of the survey population use portapotties and another 18% have no head onboard, there is a strong need to address public restroom availability at public docks and options for portapotties disposal.

- Examine options for onshore portapotties dumping stations and portable pumpouts.
- Study feasibility of pumpout boats and/or dockside facilities to have wand attachments that could be used to empty portapotties?
- Encourage marinas and yacht clubs to be more accommodating of these users.
- Evaluate current public restroom facilities at or near docks and prioritize need.
- Look into the feasibility of floating portajohns located on dock or float located at the following: Danvers River, Salem Harbor, Beverly Harbor. Each float could dock boats and have several portajohns.

³ Epilson Associates. 2000. The Massachusetts marina environmental guidebook. Draft. Prepared for Massachusetts Coastal Zone Management.

- Determine cost and possible funding sources.

5. Marina and yacht club involvement is a great resource within Salem Sound that with a few exceptions is untapped.

- Encourage marinas and clubs to set zero-tolerance or “One time shame on you, second time you’re out” policy.
- Have marinas and clubs write into lease contracts the No Discharge policy at the slip or mooring and post sign with marina rules regarding sewage disposal.
- Discourage or prohibit MSD Type I and II discharge at slip or mooring
- Encourage boaters with Type I and II MSDs to regularly fill disinfectant tanks to ensure proper operation and make sure they know how to maintain the system. BMP 9
- Encourage boaters not to wait until boat is hauled for winter to pump holding tank.
- Have dockside pumpout cart or dump station for portapotties with fresh water for cleaning and refill. (North and South Rivers on the South Shore and the Town of Marion have shore side pumpout carts. Ask others how they work, pros and cons.)
- Offer winter services to retrofit boats with holding tanks or let boaters know who will do this kind of work. BMP 14
- Encourage all boat owners to remove their existing Y-values and seacocks with thru-hulls, and plug the holes to keep all untreated sewage out of the water; or alternatively, to remove the handle on the Y-valve or use a wire tie to appropriately prevent discharge while boating in coastal waters. BMP 13

6. Commercial vessels

- Harbormasters and municipal health departments should know how each commercial vessel discharges of its waste (septic, gray water, bilge, and trash).
- Set policy for transient commercial vessels.
- Inform general boating community of commercial vessel regulations and enforcements.

6. NO DISCHARGE DESIGNATION

It was not Salem Sound Coastwatch's intent to have a No Discharge Area (NDA) established as a result of the Salem Sound Marine Sanitation Needs Assessment but rather to find out what the boating community needs and what services could be added to improve marine sanitation in Salem Sound. SSCW's primary mission is to improve the quality of water within Salem Sound such that good fishing, harvestable shellfish, swimmable waters, vital urban waterfronts and healthy natural habitats that support a diverse abundance of plant and wildlife may be restored (see www.salemsound.org).

Improper sewage discharge can cause illness and loss of economic viability. In the U.S., approximately 30 percent of all shellfish growing waters are closed to harvesting because of poor water quality. Untreated sewage discharge from boats accounts for about 13 percent of those restrictions.⁴ Shellfish accumulate contaminants from the environment. When people eat contaminated shellfish, especially when raw or partially cooked, they can become sick with death as a possibility. Since 1972, all shellfish harvesting in Salem Sound has been prohibited. In 1997, the Massachusetts Division of Marine Fisheries conducted a study of the status of marine fishery resources and water quality in Salem Sound⁵ and reported that there was potential for an improved shellfish classification based on improving water quality in Waters River, Kernwood River, Danvers River and portions of Salem Harbor. Although the thought of shellfish harvesting in Salem Sound seems a very distant possibility, SSCW continues to work for water quality that makes this a reality.

Since 1993, SSCW has been conducting water quality monitoring of outfall pipes and coastal streams as they flow out into the Sound. This monitoring has identified chronic sources of bacteria (fecal coliform and enterococcus). When detected, SSCW has worked with the municipalities to remediate the stormwater and sewer problems.

Another important improvement for Salem Sound took place in 1998 when SESD (South Essex Sewage District) wastewater treatment plant was upgraded to secondary treatment, and a diffuser pipe was extended 660 feet past the Great Haste outfall. SESD NPDES discharge permit limits

⁴ EPA. Using your head to help protect our aquatic resources. Vessel Sewage Discharge Program. Last updated on Tuesday, February 17th, 2004. URL: http://www.epa.gov/owow/oceans/regulatory/vessel_sewage/vsdflyer.html

⁵ Chase, Bradford C, J H Plouff, and W M Castonguay. 2002. The marine resources of Salem Sound, 1997. Technical Report TR-6, MA DMF, DFWLE, EOE. Gloucester MA.

SESD to a monthly geometric mean of 200 fecal coliform per 100mL with no single sample exceeding 400 colonies per 100mL. SESD takes three measurements a day (1100 tests a year) and generally bacterial test results run between 10 to 50 fecal coliform per 100mL.⁶

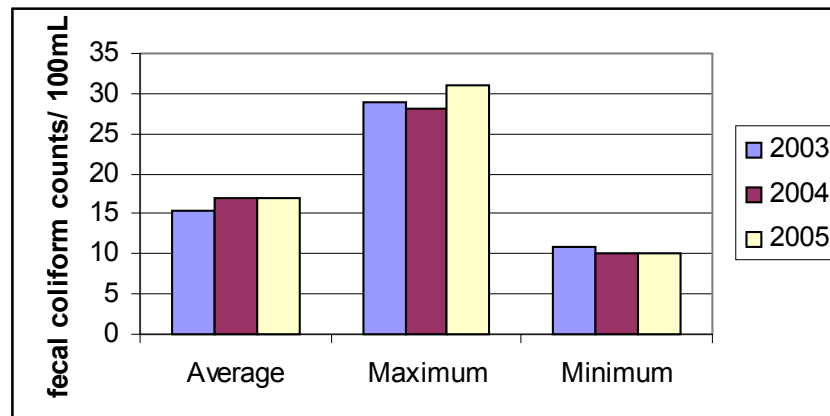


Figure 16. Geometric mean of fecal coliform per 100 mL for the past three years from the South Essex Sewer District secondary wastewater treatment plant.

Source: Randy Briggs, Superintendent of Operations

SESD was awarded an excellency award by US EPA in 2005 for excellence in operational management and maintenance of a secondary wastewater treatment facility. Several boaters commented that they would change their dumping practices when SESD cleaned up their act. This can no longer be used as an excuse by boaters. Even though boater sewage is on a much smaller scale, boat sewage is more highly concentrated, particularly if discharged at the slip or a mooring. The Environmental Protection Agency (EPA) standards for Type I MSDs (see EPA MSD Standards table on page 7) release much higher bacterial concentrations than permitted for SESD.

Salem Sound waters still need improvement as can be seen each summer as beaches are closed because of high levels of bacteria. Generally, the closures are due to activities on land and often closures occur after rain events that wash pollutants from the land out to sea. But this past summer, Stramski and Grace Oliver beaches in Marblehead were closed at a time when SSCW was monitoring the water quality of the streams flowing out on to the beaches. The results⁷ did not find high levels of Enterococci bacteria. When instances like this occur, the attention turns to boaters and their sanitation practices.

⁶ In 2005, SESD had two permit violations out of 1100 tests. Two tests reported higher concentrations than 400 fc/100mL (500 and 975). Per conversation, Randy Briggs, SESD Superintendent of Operations.

⁷ Clean Beaches & Streams Final Report 2005. Salem Sound Coastwatch. www.salemsound.org/clean_beaches.htm.

One course of action is to make an embayment, like Salem Sound, a No Discharge Area, where all boat treated or untreated sewage discharge is illegal. Salem Sound harbormasters and 86% of survey respondents support making Salem Sound a NDA. With such strong support, applying for NDA designation should be considered. To become a NDA, a written application to the EPA must be submitted by the state on behalf of the area that is seeking designation. The EPA Administrator's affirmative determination is dependent on the availability of adequate pumpout facilities, extent of the education programs for the boating community, and enforcement efforts. In EPA guidance to the states, "there is no set ratio or formula to determine the exact number of pumpout facilities necessary to serve a given population of boats. However, EPA Region 1 has determined that , in general, a range ratio of one pumpout facility per 450 boats with MSDs should be sufficient to meet the demand for pumpout services in most harbor areas. The ratio is based on best professional judgment. EPA Region 1 intends to remain flexible on this issue, and all no discharge area applications are reviewed on a case-by case basis⁸."

Extrapolating the survey results to reflect the larger Salem Sound boating population, it appears that a Salem Sound NDA designation would affect approximately 20% of the boats. To prevent discharge, padlocking the closed seacock, removing the seacock handle, or using a non-releasable wire tie or a door handle lock would be required for boats with Type I and II MSDs. Since holding tanks are required in a NDA, the 63% of boats that have Type III MSDs or portapotties would not be affected. It would also not affect the 18% of boats that currently have no facilities because recreational boats are not required to be equipped with an installed toilet. One of the EPA technical guidelines for NDA designation suggest that 50% of boats in the over 25 to 40 feet class should be equipped with Type III MSDs. The survey found that 58% of the boats between 25 feet and 40 feet in length have Type III holding tanks. When boats longer than 40 feet were included, the percentage remained at 58%. See Figure 16 and Table 4 for details.

It should be noted that boats 24 feet or less make up 37% of the boats surveyed. The majority of this size class has no head onboard or portapottie. Having an installed toilet is not required in a NDA, but the needs of those with portable toilets should be considered in any No Discharge application.

⁸ EPA. 1991. Guidance for States and Municipalities Seeking No Discharge Area Designation for New England Coastal Waters. U.S. EPA, Region I, Boston, Massachusetts. June 24, 1991 (Revised April 14, 1992.) citing from: Milliken, A.S. and V. Lee. Pollution Impacts from Recreational Boating. Rhode Island Sea Grant, University of Rhode Island Bay Campus, Narragansett, Rhode Island. 1990 and JRB Associates, Inc. Analysis of Wastewater Discharge from Marine Sanitation Devices. Final Report prepared for the Environmental Protection Agency by JRB Associates, Inc. MacLean, VA. 1981.

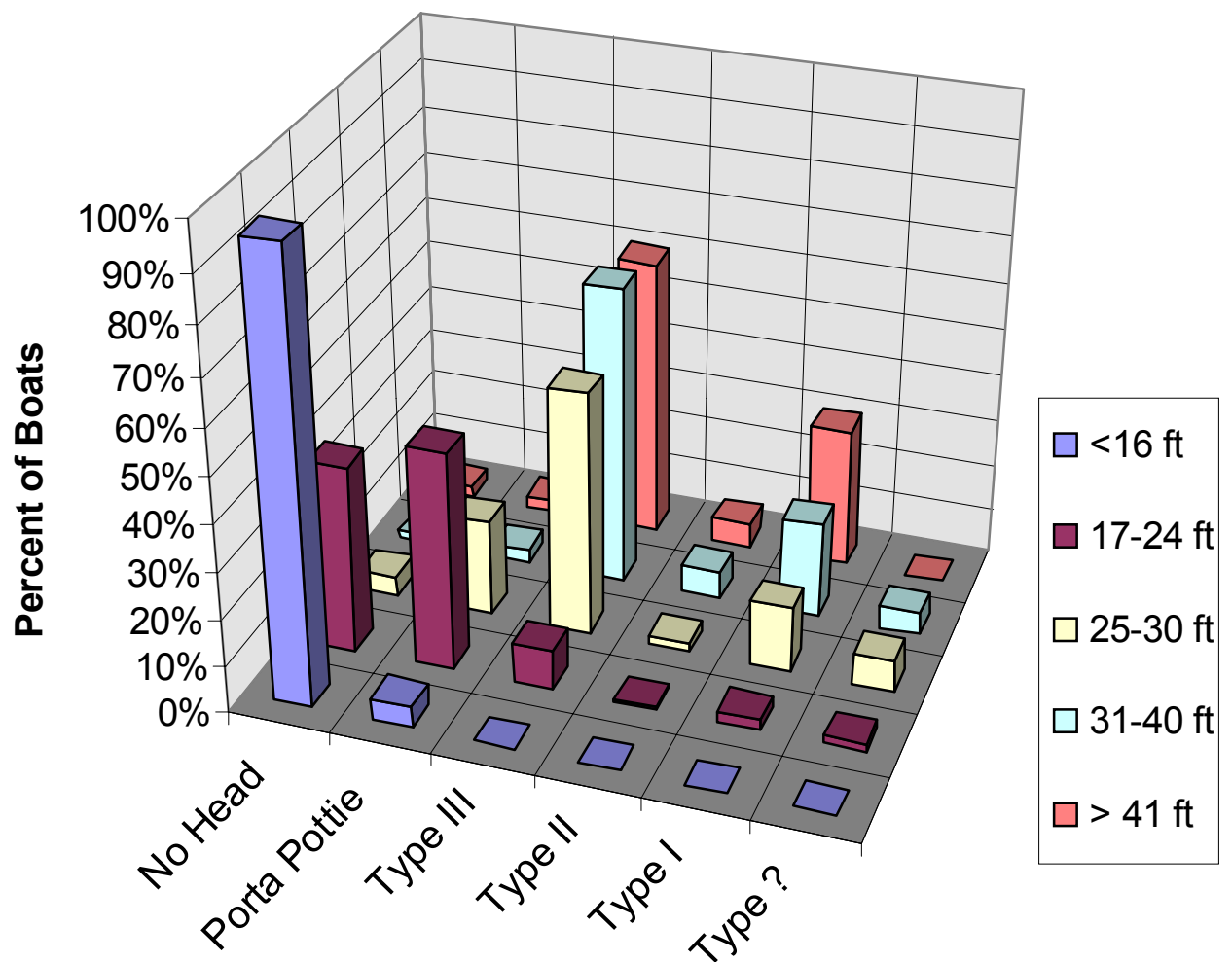


Figure 17. Graphical comparison of the percent of boats by length and different toilet options in Salem Sound Study Area.

Boat Length	No Head	Porta Pottie	Type III	Type II	Type I	Type ?
<16 ft (n = 21)	95%	5%	0%	0%	0%	0%
17-24 ft (n = 304)	40%	47%	9%	0%	2%	2%
25-30 ft (n = 275)	4%	21%	52%	2%	14%	7%
31-40 ft (n = 226)	2%	3%	64%	6%	21%	5%
> 41 ft (n = 41)	3%	3%	60%	5%	30%	0%

Table 4. Percents of MSDs and other options for each boat length class in Salem Sound Study Area.

7. CONCLUSION

The high rate of return of the anonymous boaters' survey combined with the interviews conducted by Salem Sound Coastwatch reveal an active boating community in Salem Sound, which is interested in being informed and protecting their boating environment. Because of the involvement of this boating community, the Marine Sanitation Needs Assessment compiled a substantial amount of data on the behavior and attitudes of recreational boaters and the perceived and real obstacles that make proper disposal of boat-based sewage difficult or inconvenient. The results also provide knowledge as to the frequency of vessel sewage discharge within Salem Sound. While most boaters never dump sewage, anywhere from five to fifteen percent do discharge treated or untreated sewage within Salem Sound, including at their mooring or slip. This is situation that needs attention.

Possible local solutions for improving boaters' sanitation practices and reducing illegal sewage discharge from recreational and commercial vessels have been listed as recommendations. Many of these recommendations come from comments made by boaters, pumpout operators, harbormasters and marina owner/operators. Involving these boating community groups will be essential for successful implementation of local solutions and for achieving change.

Education will be a primary means of changing behavior. Boaters need to be made aware of pumpout services in a proactive way. This Marine Sanitation Needs Assessment contains information that will be valuable in crafting targeted educational outreach regarding pumpout practices and services. Also, additions to the existing pumpout facilities and changes in their operating schedules should be examined more closely to improve convenient access to the pumpout services.

A Salem Sound Working Group should be established from members of the boating community: harbormasters and health department staff from the municipalities of Marblehead, Salem, Danvers, Beverly and Manchester, marinas, yacht clubs, Salem Sound Coastwatch, Coast Guard Auxiliary, and Power Squadrons. This group would be able to prioritize the numerous recommendations in this report and begin implementation of selected recommendations that will change sanitation practices, improve pumpout services, and ultimately, achieve the goals of reducing illegal sewage dumping and improving the water quality in Salem Sound.

APPENDIX 1. ADDITIONAL COMMENTS FROM BOATERS' SURVEY

Some took the opportunity to discuss other boating issues or concerns in their additional comments that may lead to clean water improvements:

- ☐ Need additional public docking in Salem Sound
- ☐ Implement a no open header law inside the current line for powerboats to reduce noise pollution!!!
- ☐ Clean up oil and gas slicks
- ☐ Eliminate 2 stroke engines
- ☐ 'Quiet' the cigar boats--they are too noisy!
- ☐ Prevent New Bedford ships fishing in the Sound (pogees)
- ☐ Commercial netters should stay out, fishing would be better
- ☐ Power Plant pollution
- ☐ Stormwater runoff
- ☐ Feeding the birds, ducks, geese
- ☐ Stop the large boats at marinas from pumping out bilges
- ☐ Stop the Rockmore Restaurant from dumping food waste, gray water and restroom waste into the harbor.
- ☐ Throwing regular trash, like bottles and cans, etc., is an even bigger problem
- ☐ Houseboats along Ipswich and Gloucester rivers and waterways
- ☐ It would be nice if there were someone to clean up the surface of the harbor - even once a week for one day for example. This person could cruise around in a small boat and pick up the garbage and wood chunks floating around.
- ☐ PETT Fold up toilet that uses a diaper type bag that gels everything and folds up and seals itself and is dumpster authorized for disposal. same as a diaper. There is also a urine gel bag that is reusable - used by pilots.

APPENDIX 2. PUBLIC FORUM - CLEAN WATERS FOR BOATING

12/13/2005 notes by Mary Reilly

[Intro Presentation of Results by Barbara Warren]

PowerPoint Presentation at www.salemsound.org

Q&A:

Q: Are the results broken down by community? (e.g., Danvers only)

A: BW—it's an aggregate right now. We could look at it by community but for today's purposes, we're just looking at the overall, general results

Q: Is there a correlation between the age of a vessel and MSD Type I?

A: BW—No, we did not ask age of vessel although it would have been useful to ask this since it would affect the type. It's clear that people don't understand the differences between treated vs. untreated by some of the responses on the surveys. We need better education on this topic.

Q: How often do we monitor water quality (Fecal coliform) at harbors.

A: (Wayne Attridge)—the Boards of Health in each town tests waters for bacteria levels during the summer

Q: So do we have a problem?

A: Yes.

[Clean Vessel Act Presentation by Vincent Malkoski]

Q&A:

Q: If you're pumping this much, does it get reflected in the bacterial counts on beaches?

A: VM—Boat pump-out is not the primary source of the high bacterial counts; there are many other factors. We really can't identify how much any one source is contributing.

Q: Does the act need to be reauthorized every several years (e.g., every 5 years)?

A: VM—I don't think so, although there could be threats to future funding. They could reallocate the funds. The grants are based on a tiered structure—each state gets money based on the size of its coastline and number of boats. (Size of coastline puts MA at a disadvantage as compared to Florida, for e.g.)

Also new MSD technology is an indirect threat to the program. Some claim that the newer MSDs are cleaner (thus discharging less pollution), but this discharge still contains nutrients.

The grant is a reimbursement program for towns/cities. The municipalities must budget for it up front.

[Some discussion on port-a-potty dump stations and how there is a big need for these. Looking at new technologies such as floating barges, etc. to help with pump-out...make it more convenient. This could work well in the Boston Harbor Islands, for e.g.]

Comment: it's important to education people at pump-out stations. Tell them what to do if the service is unavailable (e.g., give a number to call or location of another pump-out). There should also be mandatory training regarding pump-out use and even navigating into some of these pump-outs.

Q: Can you talk about timing and grant notification?

A: VM—we mail notices out to marinas and boaters. The application period (for this year) is until the end of January. If people need funds for something, let us know.

Comment: Availability of pump-outs is a big factor (in not using them). This is a big factor in my opinion.

Response: That's a grey area—we don't know how each harbormaster is running his station; as for hours, this is a town issue.

Q: So problem might not be to have more stations, just make them more accessible?

(No answer recorded here).

[No Discharge Area Program Presentation by Ann Rodney]

Some notes from the presentation:

- EPA administers “No Discharge Area” program
- Massachusetts does this harbor by harbor; some states do this differently
- Would like to have the entire New England coast under the program by 2010.
- It's very difficult to enforce—the program's intention is basically to change the habits of boaters.
- MSDs –laws need to be changed regarding these.
- There are many sources of pollution impacting our coastal waters. Boat sewage is one source we can control. Boaters tend to be environmentally sensitive.

[Clean Marina Program by Steve McKenna]

Some notes from the presentation:

- Clean Marina Program—recommended BMPs (see slide)
- CZM gives Coastal Pollution Remediation (CPR) and Nonpoint Source Pollution (NPS) grants

- The CPR grant has gone towards some pump-outs, but not many, probably because of the Clean Vessel program.
- The NPS grant goes primarily to public education and water quality assessment.
- SM notes the fantastic response (21%) from the Boaters Survey
- NOTE: BW will post contact information for all speakers on the SSCW Web site.

[Barbara Warren – Highlights of Survey]

BW introduces Todd Callahan of CZM and Peter Burilson of Edson International

“Recommendations” Break-out groups

Misc Notes from my break-out group (Mary Reilly)

- Even private marinas must pump out for the public if they take CVA money.
- Floating honey barges are a good answer; or a floating dock idea is good. Make it easily accessible.
- Problem of town \$\$\$ (or lack of it). The pump-out at Salem is too tight (to maneuver a large boat into it). At one time Danvers had a float, but no longer.
- Comment from Peter Wilson: Herrington Harbor (on Maryland’s Ches Bay) is touted as the most ecologically sound harbor. Town of Marion (MA) instituted a similar program. Implemented BMPs in an ecologically sensitive area.
- Town should educate people so that they don’t require the owner to be present during pump-out. Boat owners could sign a waiver.
- Have towns put flyers in mooring fee bills with information about pump-out facilities (these go out every spring).
- Make sure there is signage at each pump-out that includes hours, etc. For example, the Village St. pump-out in Marblehead has no signage at all.

[Recommendations and Panel Response]

- Comment (public): In my opinion, the first four categories of why people don’t pump-out could be grouped together – they’re all accessibility issues.
- Issue (from public): Salem only pump-outs on weekends. I think they are concerned about people (boat owners) not being there during pump-out. If they allowed this (owners not to be present), people could pre-schedule pump-outs (like Marion, MA). Marblehead allows this too.
- Salem Harbormaster: Salem sees this as a liability issue.
- Q: So why not have boaters sign a form, releasing the town from liability?
- VM—this is a good idea but it won’t happen. Each town has to assess their own risk. Many would only permit this if the state was an underwriter. It could be unrealistic for all towns to do this (could be costly in legal fees to implement and administer).
- AR—in other towns, marinas require boat owners to pump-out...they are charged for it as part of the marina fee. This could be an answer, although there would be a lot of work to get to this.
- Recommendation: advertise pump-out availability through signage on docks.

- Recommendation: Tell person what to do (give options) if pump-out is not available.
- Recommendation: More floating docks
- Comment (VM): these options could be funded through our CVA grants.
- Recommendation: include pump-out information in mooring fee bill and include a map of Salem Sound's 3-mile zone.
- Comment (VM): funding for pump-out maintenance—we do a match but towns that are strapped for money probably couldn't do this.
- Q: Could CZM fund the creation of a pamphlet?
- A: Yes, the CVA program could fund it too.
- Comment: Danvers sends out mooring permits in April—could include pump-out brochures.
- Comment (AR): Each state does have a pamphlet/card that they distribute with locations of pump-outs. If you need a larger area, there's a boating guide (The Embassy Guides) that people can purchase at many marinas. (See <http://www.maptech.com/water/embassyguides/index.cfm?infopg=rev>).
- Each state has the pump-out facilities information posted on their web sites.
- BW: Any ideas regarding port-a-potties?
- Comment: easiest way is to have it go right into a sewage system.
- Comment (PW): Pump-out—the easier and more convenient, the better. You must tailor the approach to each area—one program that works on one area may not work in another.
- Comment (VM): Problem of boat access may be due to locating the pump-out in close proximity to sewer lines.
- Comment (AR): I think that in MA, pump-out became prevalent when CVA came into being. Now people are finding out more about the best place to put them.
- Comment regarding No Discharge Area for Salem Sound. If you do this, you must put on a boaters' education program and also secure a legal way to enforce it.
- Comment (AR): In MA, it can take a year to implement a No Discharge Area. You must submit an application to the EPA. I think Salem Sound Coastwatch has already done a lot of the homework. And you must allow a 30-day comment period.
- Comment (AR): No other area on the North Shore has asked about doing a No Discharge Area. (i.e., Salem Sound would be the first).
- Comment (BW): Would need to get buy-in from all the Salem Sound communities.
- Comment (SM): Community education approach would work well.
- Comment (BW): Could create a Salem Sound working group to help with this process. Would people be willing to participate? If so, please indicate on sign-in sheet that you would like to participate.
- Comment (VM): Don't call it a "pump-out group" ☺
- Comment: problem statement must be made: what problem are we trying to solve?

APPENDIX 3. DEFINITIONS

Marine Sanitation Device from Federal Marine Sanitation Device Regulations Page 3 of 3

- Existing Vessel -- Keel laid or initial construction started before 30 January 1975.
- Type I Device -- USCG certified to 1000 fecal coliform/100 ml. no "visible floating solids" standard.
- Type II Device -- USCG certified to 200 fecal coliform/100 ml, 150 mg/1 total suspended solids standard.
- Type III Device -- USCG certified to no-discharge standard.
- Existing Device -- Those manufactured prior to 30 January 1976.

Other Definitions

- No Discharge Area (NDA) – A designated body of water in which the discharge of treated or untreated boat sewage is prohibited. It does not include greywater.
- Greywater – is sink water and it is legal to dump in a NDA unless the community regulating the water body establishes further restriction to prohibit discharge of greywater.
- Enterococcus – common bacterial species found in the intestines of humans and animals (birds). It is used as an indicator that pathogens such as viruses, bacteria and protozoans may be present in the water. These pathogens can result in gastroenteritis, cholera, hepatitis, dysentery and giardiasis. Enterococcus has replaced fecal coliform as the new federal standard for water quality at public beaches.
- Fecal coliform -- common bacterial species found in the intestines of humans and animals (birds) that has been used to test water quality for pathogens that may cause human illness.
- Nonpoint Source Pollution – diffuse sources of contaminants that cannot be attributed to a single discharge point, e.g. an industrial plant. Examples include stormwater runoff, atmospheric deposition.

As defined in the Marpol Treaty – see Appendix 5:

- Garbage -- all kinds of victual, domestic and operational waste excluding fresh fish and parts thereof, generated during the normal operation of the ship, except those substances which are covered by Article 3 (harmful substances in packaged form) and Article 4 (pollution by sewage from ships).
- Ship -- a vessel of any type whatsoever operating in the marine environment and includes hydrofoil boats, air-cushion vehicles, submersibles, floating craft and fixed or floating.

APPENDIX 4. CLEAN VESSEL ACT

Copied from http://federalasst.fws.gov/cva/cva_info.html#CVA last revised: August 27, 2004.

See <http://www.mass.gov/dfwele/dmf/programsandprojects/cvabig.htm> for Massachusetts Division of Marine Fisheries' Clean Vessel Act Program.

What is the Clean Vessel Act?

Congress passed the Clean Vessel Act in 1992 (CVA) to help reduce pollution from vessel sewage discharges. The Act established a five-year federal grant program administered by the U.S. Fish and Wildlife Service and authorized \$40 million from the Sport Fish Restoration Account of the Aquatic Resources Trust Fund for use by the States. Federal funds can constitute up to 75% of all approved projects with the remaining funds provided by the States or marinas.

Reauthorized in 1998, Congress extended the pumpout grant program through 2003, providing \$50 million to continue to provide alternatives to overboard disposal of recreational boater sewage.

What Happens When You Dump

Raw or poorly treated sewage can spread disease; contaminate shellfish beds and lower oxygen levels in water. Waterborne diseases including hepatitis, typhoid and cholera can be transmitted by shellfish. Organic matter in sewage is decomposed in the water by bacteria. During this process, the bacteria use oxygen. As a result, sewage in the water may deplete the water's oxygen level, causing stress to fish and other aquatic animals.

Shellfish are filter feeders that eat tiny food particles filtered through their gills into their stomachs, along with bacteria from sewage. Shellfish can convey nearly all waterborne pathogens to humans.

Sewage contamination is measured in terms of fecal coliform levels - bacteria found in the intestines of all warm-blooded animals. Test results are expressed as the number of bacteria per 100 milliliters (ml) of water. Shellfish beds are closed when the coliform count reaches 14 per 100 ml of water. Public beaches are closed to swimmers when the coliform count reaches 200 per 100 ml of water.

In February 1995, The Journal of the American Medical Association reported that, for outbreaks of Norwalk Virus Gastroenteritis in 70 persons in Louisiana, Mississippi, Maryland and North Carolina, who had eaten raw oysters, the source was a remote oyster bed in Louisiana. The Journal concluded that the outbreak was traced to a specific commercial oyster harvester who disposed of his untreated sewage directly overboard into the oyster bed. The U.S. Food and Drug Administration was able to trace the cause to one individual because all of the Norwalk Virus Tested had identical DNA sequence.

Areas most likely to be affected are sheltered waters with low flushing rates, waters with significant recreational value, areas set aside for shellfish harvesting, State and Federally designated significant habitats such as those in Coastal Zone programs, as well as waters designated by the Environmental Protection Agency as "No Discharge Areas."

Currently, vessels use four types of sewage disposal systems. Many people on small boats use portable toilets which can be drained at dump stations; however, vessels over 26 feet in length typically have Marine Sanitation Devices (MSDs). MSDs are available in three forms all of which can hold waste for disposal at a pumpout station.

What CVA Is Doing To Educate Boaters

The Clean Vessel Act provides a portion of its total funding for educational outreach regarding the effects of boater sewage and the means by which boaters can avoid improper sewage disposal.

The first goal aims to inform boaters of the importance of proper boater sewage disposal. Launched in February 1995, the awareness campaign has reached thousands of boaters through magazines, newspapers and television. The U.S. Fish and Wildlife Service released its awareness campaign products, including the pumpout symbol and slogan.

The U.S. Fish and Wildlife Service established partnerships with the U.S. Coast Guard, the Environmental Protection Agency, the National Oceanic and Atmospheric Administration, marine industry organizations and others to assist with outreach efforts. All nineteen known pumpout manufacturers in North America have taken a voluntary pledge to place the national pumpout symbol on each unit produced in the future. Together, these agencies and organizations work with marine interests to distribute materials and educate boaters on the use of pumpout and portable toilet dump stations. Other agencies and marine community groups are encouraged to join this partnership effort.

The Service helps sponsor the Marine Environmental Education Foundation's annual National Clean Boating Campaign, a partnership of over 650 federal, state and local agencies, and marinas, boatyards, boat dealers, trade associations, environmental organizations, Sea Grant programs, and individuals dedicated to clean boating. The Clean Boating Campaign is distributing fact sheets, including one on boat sewage control, which are reproduced and distributed to thousands of boaters across the nation. The Service is also helping the Foundation to develop and implement a National Environmental Excellence Award program which will recognize marinas, boatyards, boat dealers, yacht clubs and others for operating clean facilities and clean boating educational efforts.

The second goal informs boaters and marina operators of sewage disposal problems, educates them on the use and advantages of pumpout and dump stations, where to best locate such stations, and the fact that discharging untreated sewage on all fresh waters and any salt waters inside the 3 mile territorial limits of the United States is illegal. This effort will complement and unify existing State programs, sending one clear message. "Keep Our Water Clean Use Pumpouts".

Major national CVA educational products include a poster distributed to more than 22,000 marinas, press and training packets, and various public service announcements for radio, television and print media. States are producing their own education products.

What the Act Does

The Act was created to provide a viable alternative to the overboard disposal of recreational boater sewage. All recreational vessels must have access to pumpouts funded under the Clean

Vessel Act. The Act made grants available to the States on a competitive basis for the construction and/or renovation, operation and maintenance of pumpout and portable toilet dump stations. States may sub- grant to public and private marinas to install pumpouts. Since the Act's passage in 1992, grants have been awarded to install 2,200 pumpout stations and 1,400 dump stations. A maximum fee of \$5.00 may be charged for use of pumpout facilities constructed or maintained with grant funds.

All Seasons Marina, a private marina in New Jersey, installed a new vacuum type pumpout system on its fuel dock in August of 1996. The Clean Vessel Act funded 75% of the cost and Owner Ralph Dilks reports, "There were as many pumpouts done over the next 30 days as had been done in the previous three years using a portable pumpout located on the inside of a marina. Our marina charges \$5 per pumpout, but customers don't ask 'how much'. They just say 'pump it out'. I really think that for my State to do this, it is a great thing. This program really works."

Massachusetts' Nantucket Island has seen customer attitudes to pumpouts improve over the years. Nantucket Boat Basin manager George Bassett Jr. has "found a huge change in the boater's attitude towards pumpouts. In the early years there was little demand, and I had to strongly urge it to be done. Now demand is high and they now expect it. If one boat is being pumped, the surrounding boats request a pumpout right then."

On Lake Erie in Ohio, Battery Park has their CVA funded pumpouts located on their fuel dock. General Manager Carl Wolf said "Our dock staff do all the pumpouts, and like the job. Boaters are so happy with our staffed service that they tip very well. Using that as an incentive to summer staff, I offer the pumpout station job mainly to the returning dock hand with the best work record from the previous year." Imagine getting pumped out by the best employee of the marina!

APPENDIX 5. OTHER RESOURCES

Buzzards Bay No Discharge Area Application. 2000. Buzzards Bay National Estuary Program:
<http://www.buzzardsbay.org/bbnda2.htm> Last update: February 26, 2004.

Clean Vessel Act Program. Massachusetts Division of Marine Fisheries.
<http://www.mass.gov/dfwele/dmf/programsandprojects/cvabig.htm>

EPA Region 1 website on No Discharge Areas in New England Waters:
<http://www.epa.gov/region01/eco/nodiscrg/index.html>

EPA. Using your head to help protect our aquatic resources. Vessel Sewage Discharge Program.
http://www.epa.gov/owow/oceans/regulatory/vessel_sewage/vsdflyer.html

EPA. EPA New England No Discharge Area Strategy Document (PDF 600kb)
<http://www.epa.gov/NE/eco/nodiscrg/pdfs/strategydocument.pdf>

International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78)
http://www.imo.org/Conventions/contents.asp?doc_id=678&topic_id=258#9

Massachusetts Office of Coastal Zone Management. No Discharge Areas.
<http://www.mass.gov/czm/nda.htm>

Massachusetts Office of Coastal Zone Management. Clean Marina Guide.
<http://www.mass.gov/czm/marinas/guide/macleanmarinaguide.htm>

South Shore Vessel Pumpout Evaluation and Outreach Plan. June 2004.
Urban Harbors Institute and North and South Rivers Watershed Association.
www.uhi.umb.edu/pdf_files/ss_pumpout_report.pdf

The Ocean Conservancy. 2001. Good Mate Recreational Boat and Marina Manual.
<http://www.auxmdept.org/Good%20Mate%20Manual.pdf>

APPENDIX 6. INTERVIEW QUESTIONS

Harbormaster and Marina Questions

1. How serious do you think the issue of sewage dumping is?
2. Have you ever seen anyone dumping?
3. Do you have a zero tolerance policy when it comes to dumping sewage?
4. Do you know if you can tell the difference between what's released from Type 1 or II MSDs and raw sewage?
5. Do you know what type of MSD each boat in your harbor (marina) has?
6. Have you ever boarded a boat for MSDs inspection?
7. What are current enforcement methods do you use or have at your disposal?
8. Do people/ boaters come to you with concerns about sewage dumping?
9. Do you think the problem is getting better or worse?
10. How do you advertise the pumpout facilities and the hours available?
11. Do you know how or where commercial vessels pumpout in your area?
12. How many boaters in your area (marina) live abroad for the whole year?
13. How many boaters in your area (marina) live abroad for the summer?
14. Do you support making Salem Sound a No Discharge Area (NDA)?
15. Do you think your pumpout stations are under used or operating at full capacity?
16. Do you have any concerns and issues with your current pumpout system?
 - Staffing
 - Pumpout reliability
 - Funding

Harbormaster questions only:

17. How many years have you been a harbormaster?
18. (Danvers)- Is there a possibility of having pumpouts at no charge, or even cheaper/ longer hours (depending on location)
19. How do you see the harbormasters office being involved in boater education?

Marina questions only:

20. What do people do if they live on the boats after the pumpout facilities are closed?
21. Do you have any suggestions for future boater education?
22. What is your policy on portapottie dumping?

Pumpout Operator Questions

1. How serious do you think the issue of illegal dumping is?
2. Do you see people dumping and what would you do?
3. Do you think your pumpout stations are under used?
4. Do you have any recommendation to solve this problem? Prioritize/most critical problem and would you like to see any changes?
5. How do you advertise the pumpout station and the hours available?
6. Do you have any concerns and issues with your current pumpout system?
7. Have your experienced equipment problems in the past?
8. Will you send us your pumpout log at the end of the season?
9. Have you ever received complaints from customers?
10. Do you think more pumpout locations are needed? Where? What are the obstacles to adding more this?
11. Would you support adding a dockside portapottie pumpout or portable toilet dump station?
12. Do you have any suggestions for possible ways to increase pumpout usage by boaters that aren't using your service?
13. Do you support making Salem Sound a No Discharge Area (NDA)?

APPENDIX 7. BOATERS' SURVEY QUESTIONNAIRE

BOATERS' ANONYMOUS SURVEY - Summer 2005

The purpose of this ANONYMOUS SURVEY is to understand current marine sanitation practices within Salem Sound waters and to develop recommendations that will better serve the boating community.

Thank you for your help.

This survey may also be taken online at www.salemsound.org.

Check the appropriate box. If you have more than one boat, please fill out the survey for the most frequently used boat.

<p>1. How many years have you been boating ? <input type="checkbox"/> 1 - 10 <input type="checkbox"/> 31 - 40 <input type="checkbox"/> >61 <input type="checkbox"/> 11 - 20 <input type="checkbox"/> 41 - 50 <input type="checkbox"/> 21 - 30 <input type="checkbox"/> 51 - 60</p> <p>2. Your boat's primary use ? <input type="checkbox"/> Recreational <input type="checkbox"/> Commercial <input type="checkbox"/> Both</p> <p>3. Your boat's length in feet ? <input type="checkbox"/> <16 <input type="checkbox"/> 25 - 30 <input type="checkbox"/> 41 - 59 <input type="checkbox"/> 17 - 24 <input type="checkbox"/> 31 - 40 <input type="checkbox"/> 60 +</p> <p>4. Type of boat ? <input type="checkbox"/> Motor <input type="checkbox"/> Sail <input type="checkbox"/> Other</p> <p>5. Does your boat have a galley ? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>6. What is the maximum number of people your boat can carry ? <input type="checkbox"/> 4 or less <input type="checkbox"/> 5 - 8 <input type="checkbox"/> 9 - 16 <input type="checkbox"/> 17 - 25 <input type="checkbox"/> 26 or more</p> <p>7. On average, how many people are onboard at one time ? <input type="checkbox"/> 4 or less <input type="checkbox"/> 5 - 8 <input type="checkbox"/> 9 - 16 <input type="checkbox"/> 17 - 25 <input type="checkbox"/> 26 or more</p> <p>8. When your boat is in the water, where do you typically moor or dock it ? Name the harbor, river, marina, or yacht club. <hr/></p> <p>9. Do you "day trailer" your boat ? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>10. How do you refuel your boat ? <input type="checkbox"/> Carry on <input type="checkbox"/> Fuel at dock <input type="checkbox"/> Other</p> <p>11. On average, how many days a year are you onboard your boat ? <input type="checkbox"/> 20 or less <input type="checkbox"/> 21 - 36 <input type="checkbox"/> 37 - 60 <input type="checkbox"/> 61 - 90 <input type="checkbox"/> >90</p> <p>12. Do you live onboard ? <input type="checkbox"/> No <input type="checkbox"/> Yes, summer <input type="checkbox"/> Yes, all year</p> <p>13. Do you swim or fish where you moor or dock your boat ? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>14. Do you have a head onboard and if yes, which MSD type is it ? <input type="checkbox"/> No <input type="checkbox"/> Yes, Type 3 - holding tank <input type="checkbox"/> Yes, portapottie <input type="checkbox"/> Yes, but don't know type <input type="checkbox"/> Yes, Type 1 - macerates, treats & disinfects <input type="checkbox"/> Yes, Type 2 - macerates & higher degree of treatment</p>	<p>15. When onboard, what percent of the time are you at the mooring or slip ? <input type="checkbox"/> < 33% <input type="checkbox"/> 75% <input type="checkbox"/> 100% <input type="checkbox"/> 50% <input type="checkbox"/> 90%</p> <p>16. Do your current practices include dumping sewage overboard ? <input type="checkbox"/> Yes, treated <input type="checkbox"/> Yes, untreated <input type="checkbox"/> No</p> <p>17. If you answered yes to question 16, where do you dump ? (Check all that apply) <input type="checkbox"/> beyond 3-miles of coast <input type="checkbox"/> within 3-miles of coast <input type="checkbox"/> at mooring or slip</p> <p>18. If you have ever pumped overboard within 3-miles of shore, the reason(s) was: Please check all that apply. <input type="checkbox"/> Holding tank odors objectionable. <input type="checkbox"/> Did not know how to prevent flushing overboard. <input type="checkbox"/> Boat's plumbing broke or malfunctioned. <input type="checkbox"/> Do not see any problem pumping overboard. <input type="checkbox"/> No pumping facility available. <input type="checkbox"/> Have Type 1 or 2 head, so it is okay to discharge. <input type="checkbox"/> Did not know the 3-miles offshore boundary. <input type="checkbox"/> Other: _____</p> <p>19. Have you used local pumpout facilities? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>20. How many pumpout facilities are you aware of in your area ? <input type="checkbox"/> one <input type="checkbox"/> two <input type="checkbox"/> three <input type="checkbox"/> four <input type="checkbox"/> more than four</p> <p>21. Which type of pumpout do you normally use? <input type="checkbox"/> Dockside <input type="checkbox"/> Boat <input type="checkbox"/> Both <input type="checkbox"/> None</p> <p>22. If you answered None to question 21, would you consider using a boat pumpout ? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>23. Please check any that describe your experience in the past two years. <input type="checkbox"/> Pumpout not available. <input type="checkbox"/> No pumpout conveniently located near my boat. <input type="checkbox"/> Pumpout available but not functioning. <input type="checkbox"/> Available but no staff to operate pumpout. <input type="checkbox"/> Available but I didn't know how to operate it. <input type="checkbox"/> Pumpout inaccessible (e.g. water too shallow or hose too short). <input type="checkbox"/> Waiting line or time too long. <input type="checkbox"/> Pumpout cost too high. <input type="checkbox"/> None apply.</p> <p>24. If you use a Portapottie, where do you dump it ? <input type="checkbox"/> Marina <input type="checkbox"/> Home <input type="checkbox"/> Public Restroom <input type="checkbox"/> Other</p> <p>25. Would you use a dock Portapottie pumpout if available? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>
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Please continue to the back.

Page 2 - BOATERS' ANONYMOUS SURVEY - Summer 2005

26. Do you think sewage from boats: *Check all that apply:*

- ☐ Provides food for fish.
- ☐ May cause problems at beaches.
- ☐ Increases toxins in the water from MSD disinfectants and deodorizers.
- ☐ Has no affect because it becomes diluted & biodegrades.
- ☐ Increases human health risks to disease & parasites.

27. Are you aware of the federal law that prohibits discharging untreated sewage from vessels within all navigable waters of the U.S., including coastal waters (within 3-miles of shore) ?

- ☐ Yes ☐ No

28. If you saw sewage being discharged from a boat, would you report it ?

- ☐ Yes ☐ No

29. If yes, who would you contact ?

30. Would you support a "No Discharge Area" for Salem Sound ?

In a NDA, any discharge of boat sewage, even treated, is prohibited.

- ☐ Yes ☐ No

31. In your opinion, what additional sanitation services are needed or could be improved?

32. Additional Comments:

Please return your completed survey to Salem Sound Coastwatch, 201 Washington St. #9, Salem MA 01970 , or drop it in the survey box at your local harbormaster or check at your marina.

Thank you for completing this anonymous survey. This product is funded through the Coastal Nonpoint Pollution Grant Program made possible by NOAA and administered by the Massachusetts Office of Coastal Zone Management. The results and recommendations from this survey will be available December 2005 online at www.salemsound.org or at the SSCW office. SSCW is an independent non-profit working in Beverly, Danvers, Salem, Peabody, Manchester, and Marblehead. Phone: 978-741-7900.
